# WATER RESOURCES

THE UNIVERSITY
OF MICHIGAN

FEB 4 1960

MAIN
READING ROOM

## HEARINGS

BEFORE THE

## SELECT COMMITTEE ON NATIONAL WATER RESOURCES UNITED STATES SENATE

EIGHTY-SIXTH CONGRESS

FIRST SESSION

PURSUANT TO

**S. Res. 48**

---

BILLINGS, MONT., OCTOBER 9, 1959
MISSOULA, MONT., OCTOBER 12, 1959

---

**PART 3**

---

Printed for the use of the Select Committee on National Water Resources

UNITED STATES
GOVERNMENT PRINTING OFFICE
48186 WASHINGTON : 1960

## SELECT COMMITTEE ON NATIONAL WATER RESOURCES

(Pursuant to S. Res. 48, 86th Cong.)

ROBERT S. KERR, Oklahoma, *Chairman*
THOMAS H. KUCHEL, California, *Vice Chairman*

DENNIS CHAVEZ, New Mexico
ALLEN J. ELLENDER, Louisiana
WARREN. G. MAGNUSON, Washington
CLINTON P. ANDERSON, New Mexico
HENRY M. JACKSON, Washington
CLAIR ENGLE, California
PHILIP A. HART, Michigan
GALE W. McGEE, Wyoming
FRANK E. MOSS, Utah
JAMES E. MURRAY, Montana, *Ex Officio*

MILTON R. YOUNG, North Dakota
ANDREW F. SCHOEPPEL, Kansas
FRANCIS CASE, South Dakota
THOS. E. MARTIN, Iowa
HUGH SCOTT, Pennsylvania

THEODORE M. SCHAD, *Staff Director*
PAUL McBRIDE, *Chief Clerk*
BARBARA H. JIBRIN, *Editor*

DEPOSITED BY THE
UNITED STATES OF AMERICA

HD
1694
.A4
1960
pt.3

# CONTENTS


| | Page |
|---|---|
| Alter, Amos J., administrator, Alaska Water Pollution Control Board, chairman, Pacific Northwest Pollution Control Council | 465 |
| Anderson, Hon. LeRoy H. a Representative in Congress from the State of Montana | 341 |
| Bates, Grace, vice-chairman, Montana Democratic Central Committee | 428 |
| Brandborg, G. M., Montana Conservation Council | 468 |
| Bureau of Reclamation, William I. Palmer, acting commissioner | 362 |
| Clark, Brig. Gen. Allen F., Jr., division engineer, U.S. Army Engineer Division, North Pacific | 431 |
| Clark, Dr. Wilson F., vice president, Montana Conservation Council, professor of science, Eastern Montana College of Education | 413 |
| Clarkson, A. W., assistant director, division of Environmental Sanitation of the Montana State Board of Health for Dr. G. D. Thompson, Acting executive officer | 367 |
| Clavadetscher, Carl J., mayor, Billings, Mont | 352 |
| Clinton, Frank M., regional director, Bureau of Reclamation | 345 |
| Cornwall, J. W., chairman, Washington State Soil Conservation Committee | 463 |
| Corps of Engineers | 361 |
| Corps of Engineers, Water Resource Program, Montana | 432 |
| Craighead, John J. leader, Montana Cooperative Wildlife Research Unit, Montana State University | 457 |
| Cramer, Albert J., president, Flathead Lakers, Inc | 540 |
| Deckert, Tom, president, Montana Wildlife Federation | 415 |
| Dellwo, Dennis, secretary, Flathead Irrigation District | 482 |
| Everin, Walter J., director, Montana Fish and Game Commission | 420, 536 |
| Fabrick, D. P., chairman, Montana State Planning Board | 356 |
| Fickes, Clyde P., executive secretary, Upper Columbia Development Council | 528, 529 |
| Foster, Mrs. M. Y., president, League of Women Voters of Montana | 497 |
| Fraser, Willard E., Billings, Chamber of Commerce | 421 |
| Hagen, Harold, president, Montana Reclamation Association | 483 |
| Harlow, P., president, committee for Paradise Dam | 495 |
| Hazen, John B., vice president and general manager, Butte Water Co | 540 |
| Hide, Dr. J. C., professor of soils, Montana State College | 372 |
| Hurtt, Leon C., president, Grasshaven Ranches, Billings, Mont | 427 |
| Iman, Mrs. Jack, Hamilton, Mont | 535 |
| Kenfield, Leonard, president, Montana Farmers Union | 397 |
| Lackman, George, region IX director, National Rural Electric Cooperative Association | 394 |
| Logan, Mrs. Frances, secretary, committee for Paradise Dam | 487 |
| Loman, Ray M., president, Upper Columbia Development Council | 525 |
| Mahoney, Charles, president, Upper Missouri Transmission Cooperative, and president, Midwest Consumers Association | 387 |
| Mahoney, Eugene H., State senator, committee on Paradise Dam | 484 |
| Mansfield, Hon. Mike, U.S. Senator from the State of Montana | 338, 430 |
| McGowan, Gordon, State senator, Highland, Mont | 473 |
| Merritt, Clifton, Flathead County Wildlife Association | 482 |
| Metcalf, Hon. Lee, a Representative from the State of Montana | 428 |
| Montana Association of Soil Conservation Districts, with resolution | 538 |
| Montana Conservation Council | 543 |
| Moon, Gareth C., State forester, Montana | 476 |
| Murray, Hon. James E., U.S. Senator from the State of Montana | 337, 426 |
| Nelson, H. T., regional director, Bureau of Reclamation | 444 |
| Norwood, Gus, executive secretary, Northwest Public Power Association | 520 |

Page

Pike, Eugene, manager, Missoula Electric Cooperatives, trustee, Northwest Public Power Association ..... 517
Polson Chamber of Commerce, legislative committee, letter from, to Senator Kerr ..... 541
Raff, Colin W., vice president, Montana Power Co ..... 381
Ravalli County Farmers Union ..... 539
Ravalli County Fish and Wildlife Association ..... 539
Renne, Roland R., president, Montana State College ..... 436
Sowerwine, J. O., director, Montana State Planning Board ..... 453
Stone, Albert W., associate professor of law, Montana State University, director, Annual Water Resources Conference ..... 450
Strong, Clarence C., retired, U.S. Forest Service ..... 524
Sweetland, William B., Kalispell Chamber of Commerce ..... 533
Swenson, Frank A., U.S. Geological Survey ..... 411
Taylor, DeMar, Montana Reclamation Service ..... 478
Waldo, Edward R., manager, Billings Water Department ..... 353
Weller, Robert C., executive secretary, Montana District Council, United Brotherhood of Carpenters and Joiners of America ..... 536
Weydemeyer, Winton W., master, Montana State Grange ..... 537

MAPS

Clark Fork Basin, Montana ..... Facing 450
Montana watershed—water development ..... 501
Clark Fork River and tributaries in Montana ..... 530

# WATER RESOURCES

FRIDAY, OCTOBER 9, 1959

U.S. SENATE,
SELECT COMMITTEE ON NATIONAL WATER RESOURCES,
*Billings, Mont.*

The select committee met at 10 a.m., pursuant to Senate Resolution 48, in the Chamber of Commerce Building, Senator Robert S. Kerr (chairman) presiding.

Present: Senators Kerr (presiding), Murray, Kuchel, and Young.

Present also: Representatives Anderson and Metcalf.

Also present: Theodore M. Schad, staff director of the select committee, and Paul McBride, chief clerk.

The CHAIRMAN. It is a great pleasure for me as chairman to open this hearing of the Senate Select Committee on National Water Resources here in Billings, Mont., today.

This committee is a little different from the regular standing committees of the U.S. Senate, and therefore I will say a few words about its formation and its mission.

The committee was established by Senate Resolution 48, of which your great Senators Murray and Mansfield were joint sponsors, in the 1st session of the 86th Congress last April 20.

Membership of this committee was taken from the four standing committees of the Senate which have primary responsibilities in the water-resources field: Public Works, Interior and Insular Affairs, Interstate and Foreign Commerce, Agriculture and Forestry.

We have 17 members, all but 4 of whom are from the 17 Western States.

Our membership includes the chairmen of the four standing committees which I have just mentioned. This committee is a temporary one. It will make its study, formulate its report, make its recommendations, and will cease to exist on January 31, 1961.

The committee is directed to make studies of water-resources activities in the United States and make recommendations as to the character and extent of the projects, as well as the legislation, that will be needed between now and 1980 to enable the Nation to meet its requirements for water forage, its growing population, and its expanding industrial production.

Every year each of the standing committees handles a great deal of legislation relating to water resources, and the Senate has been increasingly concerned over the ability of the national water resources to meet all of the demands which will be made on them as our Nation continues to expand.

We see our totalitarian rivals on the other side of the globe committing increasing proportions of their annual budgets to developing their water resources.

This and other facts raise serious questions as to whether our present efforts in the field of the development of our water resources are adequate.

In the past 50 years there have been more than 20 major reviews of the national water resources by various commissions and committees of the executive and legislative branches of the Government seeking to find the answer as to what should be done. No less than seven of these have been within the past 10 years. Most of the reports have not been given adequate distribution. The information they contain has not gotten through to the American people in such a way as to stimulate the action which appears to be necessary if our pyramiding demands for water are to be met.

It is too early to give any hint of what the Select Committee on National Water Resources will accomplish as our work is just getting off to a good start.

However, it is already evident to me that with the wonderful cooperation that has been given us by the many States and Federal agencies upon whom we have made demands for information, it is inevitable that our committee will be able to present the national water problems in such a way that the American people using the information will be able to unite behind the committee and the Congress to bring about the action necessary to solve our problems in this regard.

Today it is my pleasure to be here with the vice chairman of this committee, the distinguished senior Senator from California, Mr. Thomas Kuchel; and one of its outstanding members, the distinguished Senator from North Dakota, Mr. Milton Young.

We are most fortunate to have as one of our members on an ex officio basis, your great senior Senator Jim Murray, with whom it has been my privilege to serve in the U.S. Senate since January 1949. He is one of the great men whom I have met and with whom I have become acquainted in the Senate, having been one of its leading Members since 1934 and a member of the Senate Interior Committee since its inception in 1946 and of which he is the chairman.

The West has been most fortunate in having him as chairman of that important committee. During his years of service in the Senate and on the Interior Committee, he has also been the leader in the effort toward conservation of our natural resources. As I said a while ago, with his junior colleague, the majority leader's assistant in the Senate, your distinguished Senator Mansfield, he was sponsor of Senate Resolution 48 which brings us here today.

At this time I would like to call on Senator Murray for any statement he wishes to make and to introduce the witnesses he has scheduled to appear, and I want to thank him for the arrangements he made, for the courtesies extended to us, and for the opportunity of being here with him.

Senator Murray.

Senator MURRAY. Thank you, Senator Kerr.

## STATEMENT OF HON. JAMES E. MURRAY, U.S. SENATOR FROM THE STATE OF MONTANA

First, let me express my appreciation of your presence here today with us on the commencement of the studies we are about to make, and I am sure that as a result of your efforts we will be able to present a case which will require immediate consideration and action by the administration.

I want to express my appreciation to the members of the Senate Select Committee on National Water Resources for coming to Montana for two hearings.

Present is Senator Milton Young, of North Dakota, our neighbor, who is a dependable ally on resource and farm issues; also, Senator Thomas Kuchel, of the State of California, a valued member of our committee.

I want to say that we have very pleasant associations with these Senators from other parts of the country and from the other party in the United States. They have been very helpful to us. They have been able and helpful in every respect in working out the programs that we have before us.

It is a special pleasure and honor to be associated in these hearings on water resources with my friend, Senator Robert S. Kerr of Oklahoma, for he is a real pioneer in the field.

Before he was a United States Senator, Bob Kerr was Governor of Oklahoma. As Governor of Oklahoma, he inaugurated an aggressive water resources program in his own State which he has continued to press as Senator to the very great advantage of Oklahoma and her sister States in the Southwest. Senator Kerr and other members of this committee have all helped us on Montana water resources projects in the past, and these 2 days of hearings should assure their aid for years to come. I am proud to have Bob Kerr here also because he and I see eye to eye on the wisdom of investment in resources development.

I cannot accept the view that expenditures for water projects are a wasteful and unnecessary squandering of money which unbalances the Federal budget. They are investments in productive capacity. No industrial enterprise can thrive and grow unless it installs the machinery and equipment necessary to produce things of value. It must expand that capacity as demand grows or stagnate and lose out to competitors.

Our Nation, even more than a business institution, must be constantly expanding its productive capacity and its production. Population is constantly increasing. If we pinch pennies and continue to follow a "no new starts" policy nationally, it means that there are going to be less goods and less dollars for each individual citizen, and declining national prosperity. We would soon be fighting over the division of scarcities when we should be developing additional resources.

It is absurd to be squabbling over water shortages, electric power shortages, mineral shortages, and other scarcities when we have an abundance if we will only invest a few dollars and reach out and use it.

I have recently introduced a bill in the Senate, with 30 of my colleagues as cosponsors, which proposes to establish a continuing re-

sources and conservation council in the executive branch of the Government, a Joint Committee on Resources in the Congress, and to require that Congress and the Nation get an annual report on where we stand in regard to each of our resources. It is called the Resources and Conservation Act of 1960, for we hope that it will be enacted by the coming session of Congress. It undoubtedly will pass unless those who want to keep American poor and weak make a fight against it, using the veto power to defeat it.

Our resources requirements are measurable. We can meet the needs of a growing and prosperous economy if we only plan for it and go about the necessary development.

It is the purpose of the Resources and Conservation Act of 1960 to start with the basic water study of this committee, the Materials Policy Report of 1952, the recreation resources review now under way, and other similar basic studies and keep us advised annually on where we stand and what we need to do to keep abundant resources available to the Nation at all times.

The most essential of all of our resources, except possibly the air we breathe, is water. There is a real scarcity in a few arid areas in the United States. There is an unnecessary scarcity of water in some additional areas because we have failed to use it wisely, wasted it, polluted it, or failed to undertake the water control projects which would make it available for use and even reuse where that is necessary.

This Select Committee on National Water Resources is attempting to determine what our needs for water will be 20, 40, and 50 years from now and outline a program for meeting those needs.

I have been gratified that Montana's finest experts on water problems in government, in the college and university, and in private life are appearing here today, or at Missoula next Monday, to give the committee the benefit of their knowledge and their views. They are serving both the State of Montana and the Nation in so doing.

Because of duties in Washington, Senator Mansfield is unable to attend these hearings, and has submitted a statement which I ask to have included in the record at this point.

(Prepared statement of Senator Mansfield follows:)

STATEMENT OF SENATOR MIKE MANSFIELD, DEMOCRAT, OF MONTANA

At the time my distinguished colleague, the senior Senator from Montana, James E. Murray and I introduced Senate Resolution 48, I had hoped that its purpose and organization would be put into operation at an early date, and this in fact has happened more rapidly than expected. We were indeed delighted by the tremendous response with which it was received by our colleagues in the Senate and I am especially pleased at the active leadership taken by the very able chairman of the Select Committee on National Water Resources, the senior Senator from Oklahoma, Mr. Kerr, in putting his committee to work at an early date on what we consider to be one of the most serious problems facing this Nation, the status and character of our water resources.

The hearings that have been scheduled throughout the country should provide an abundance of field testimony upon which this committee can proceed to evaluate our supplies and uses of water. I am sure that the excellent group of witnesses who will be heard here in Billings and in Missoula will make fine contributions.

In the instance of Montana's two very able Congressmen Lee Metcalf and LeRoy Anderson, I know that they can give the select committee some very valuable testimony before its work is concluded. The water problems in Montana's two congressional districts are similar in some respects, but also there are some rather striking contrasts. As you know, in Mr. Metcalf's district the

terrain is generally rugged and mountainous and is the source of many of the Northwest's finest rivers and streams such as the Columbia and Missouri Rivers. I think it would be safe to say that the western district has an abundance of water resources awaiting development. However, in Congressman Anderson's district conditions are more arid and there is a serious need for water conservation, flood control, and irrigation.

The American Continent has been a land of plenty in the eyes of most of us since the early days of colonization, but in recent years we are being awakened to the fact that this is no longer so. America is no longer self-sufficient. We must depend on foreign sources for certain products as well as markets for our finished goods.

In the early days the American people just assumed that there was plenty of water to be found everywhere and it was generally a true assumption. However, in recent years it has become quite apparent that we can no longer afford to take our water supply for granted.

Constantly growing urban areas are placing tremendous burdens on city water supplies. Industrialization is requiring increased amounts of water with each new process. Industrial use of water is of vital consideration in attracting new industry, as several Montana communities have discovered. Pollution has become a very serious problem in urban areas as well as in newly developed areas such as Montana. Recreation demands on our lakes and streams become greater with each season. More and more Americans are seeking the relaxation and pleasures of the outdoors.

Desalinization is becoming extremely important. Flood control and irrigation are still among the more serious of our conservation problems. Hydroelectric power projects continue to be the key to the development of our more sparsely populated areas. The few remaining natural damsites are at a premium and both private and public power concerns are giving more attention to coordinated use of rivers and streams so that the ultimate benefit can be realized.

Numerous studies have been made in the past on the various aspects of water resources. Some have been very extensive and others have been more limited. Some of the recommendations have been put into operation but unfortunately far too many of these reports and reviews are collecting dust in some storeroom.

I first discussed my views on our national water resources with folks here in Montana. I thought perhaps the establishment of a Water Department in Washington would be the solution. Such a department would take over the various activities in pertaining to water resources which are now scattered throughout the many agencies and departments of the Federal Government. I continue to feel that our water resources problem is serious enough to demand such far-reaching recommendations, and, it does require considerable study and thought. It was for this reason that I decided the establishment of a select committee to study the problem would be the best way and would devise the best means of coordinating our efforts in this area.

It is my sincere hope that the Select Committee on National Water Resources will leave no stone unturned in probing the diverse problems of water. The select committee has at its disposal many existing studies and reports, the talents of many experts in private industry, from our colleges and universities, and from the various agencies and departments of the Federal Government. Above all the select committee is composed of Senators who have a genuine interest in the water problems of the United States. This is indeed a fine and representative committee of the United States Senate.

I have a great deal of confidence in both of my senior colleagues, Senators Murray and Kerr. They both have enviable records in water resource development. I am confident that under their guidance the select committee will finish its work expeditiously and will bring to the Senate recommendations which will tie together the many segments of the water resource problem, so that we may have a unified and integrated program for the continued development of the Nation's water resources.

The State of Montana has an abundance of water, in fact we probably are more fortunate than most, but certain areas of the State are almost arid and suffer from the lack of adequate moisture. Many of our streams and rivers are becoming polluted from inadequate protection from sewage and industrial wastes. The Treasure State has an abundance of natural resources but to date they have been extracted for processing outside of the State. Montana provides excellent opportunities for developing new industries, but this requires the

harnessing of our waters for the generation of hydroelectric power. There are a number of excellent powersites in Montana which are awaiting development. Only after generators are established at these damsites can we offer the necessary inducement for new industry.

Pollution is a problem which has raised its ugly head in Montana in the past several years. Our State is largely a rural State, but many of our cities are experiencing rapid growth and at the same time they are confronted with some very serious pollution problems because of inadequate sewage disposal. In certain areas of the State uncontrolled industrial wastes have contributed to the pollution of the rivers and streams. Pollution is something that should not be tolerated, it may not be pleasant, but it is something that has gotten too far out of hand. Pollution of our rivers contribute to disease and most of all it destroys the productivity of our rivers and streams.

This last consideration is vital in a State such as Montana because one of its major attractions is its excellent fishing streams and lakes and recreation areas. The rivers along the densely populated east coast give ample evidence of what can happen. These rivers have become unproductive, unsightly, and contaminated because of inadequate pollution control. I do not want this to happen in Montana.

If property treated the waters of our State can serve multiple uses: power generation, recreation, processing, and for human consumption, but this takes planning and cooperation.

In areas where water has become a scarcity or where demands have outgrown the supplies, we must learn how to conserve the existing supplies.

The Federal Government is active in many areas of water-resource development and we have many different programs and agencies. What I hope can be done in the not too distant future is to have these various programs coordinated under a unified operation. Water has become too precious an item to allow its use and conservation to extend in every direction without a single purpose.

In the past year I have discussed the magnitude, the complexity, and the urgency of the water-resource problem with my colleagues in the Senate; I have given testimony before committees of Congress, and I have discussed the issue at length on the floor of the U.S. Senate. I believe that I can safely say that there is a great and serious need for a broad-gage legislative program as the basis for comprehensive water-resources development by Federal, State, and private agencies. This legislative program should furnish the impetus for coordinated development at a rate that will provide the quantity and quality of water that will be required in the coming years. It should encourage the adoption of new technical discoveries and improvements. It was for these reasons that I was prompted to introduce Senate Resolution 48 which created the select committee.

The Federal Government and its agents have an extremely important role to play in water-resource development and conservation, but it is not Uncle Sam's responsibility alone. The individual States, the local governments, and, in fact, every citizen has an important role to play. If we are to be successful in reaching the goals that are established it must be a cooperative effort. It is up to each and every one of us to participate in deciding what we want in the way of fully developed water resources and how we should go about doing it. The purpose of these field hearings here in Montana and elsewhere throughout the country is to bring together this valuable testimony.

In conclusion, I wish to say only that the United States is blessed with an abundance of water fully enough to meet all national requirements, but this is dependent on its wise use and full development. The Select Committee on National Water Resources of the U.S. Senate can provide the means to this end.

Senator MURRAY. Present in the hearing room today is Congressman Metcalf of the First Congressional District. Also present is Congressman LeRoy Anderson, who desires to make a statement. In Washington we have a rule that Senators and Congressmen shall be allowed to testify first so they can go to other committee meetings and attend to other business. Congressman Anderson has to catch an 11:30 plane today, so we are going to apply the Washington rule and hear him first.

Congressman Anderson.

## STATEMENT OF HON. LeROY H. ANDERSON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MONTANA

Representative ANDERSON. Senator Kerr.

The CHAIRMAN. Good morning, Congressman.

Representative ANDERSON. Senator Murray, Senator Kuchel, Senator Young, Congressman Metcalf.

May I welcome you to the Second Congressional District of Montana, a district whose people I have the honor to represent in the House of Representatives, and to say that we are indeed most grateful to you, Senator Kerr, and to these members of your fine committee, for coming to eastern Montana for this hearing on water problems.

We have had a drought here in my district in the past year and water problems today are extremely pressing and important in our minds. As we are a semiarid State, water is the very lifeblood that flows through the veins of our economic body here in Montana.

It is good to know that members of the U.S. Senate, as well as my own House of Representatives, recognize the importance of our water resource problems and that you are studying it and readying programs to meet the Nation's water needs, even if the executive branch of the Government appears to be unconcerned.

The water scientists classify eastern Montana as semiarid. Our principal ground water problems in most areas is that we haven't found any ground waters. Consequently, we have great concern about the conservation of surface waters, their impoundment and their best use.

We are extremely pleased that the Public Works Committee of the House of Representatives has directed the Corps of Engineers to restudy the slack water navigation in the lower Missouri River, because we in the upper part of the Missouri River do not feel that either the upper or the lower Missouri Basin can afford to dedicate the bulk of our water supply to a flowing navigation channel in the lower reaches of the river.

In my opinion, the day will inevitably come when the lower basin itself will need more water for consumptive industrial and agricultural uses than flowing navigation will permit to be used. So we in the House were exceedingly pleased to have such a study going forward to eliminate the requirement for this flowing navigation channel.

Senator KUCHEL. May I interrupt you, Congressman?

Representative ANDERSON. Certainly, Senator.

Senator KUCHEL. Is there any constitutional problem involved in what you say? It is rather interesting.

Representative ANDERSON. Slack water navigation?

Senator KUCHEL. Yes.

Representative ANDERSON. In what nature? I have not heard one raised.

Senator KUCHEL. Just as you were talking it occurred to me. I wondered whether there was or was not any possibility of a constitutional question being involved.

Representative ANDERSON. I am not aware of any at the moment. We have certain problems that arise constantly regarding conflicts of interest between the upper basins and lower basins, between those in the headwaters and those down below. That conflict is certainly the greatest in the matter of navigation, where a year or so ago we had to open the headwaters of Fort Peck and let all that water run down in order to keep a flowing channel going in the lower Missouri, with the result that we did not have the water left up here in Fort Peck Dam that we felt we were entitled to.

Senator KUCKEL. Who was responsible for the decision to continue the stream flow?

Representative ANDERSON. I presume the Corps of Engineers is responsible for maintaining that stream flow.

This is a problem that gets pretty involved and Senator Murray and I have often discussed this proposition because the legislation in the previous sessions of the Senate and the House is not quite clear in discriminating between the use for hydroelectric power and reclamation and navigation downstream.

Now, there is a lot of controversy. I do not think it is constitutional. It is simply a legislative question. I think most of the questions that have to be resolved here will not be constitutional. They may be legislative, but many of them are simply questions of cooperation between the upper States and the lower.

Senator KUCHEL. I appreciate your letting me interrupt you because I think you have touched on a highly important problem that this committee needs to consider.

In the State from which I come, for example, as you well know, the law of the river, the Colorado River, was agreed to in a compact some 25 years ago. The dispute remains as to what the language may mean, but the point of it is in the absence of an agreement with respect to the waters of an interstate stream, there is a serious question legislatively and I raise the possibility of a constitutional question being involved.

Representative ANDERSON. There may very well be the constitutional, or certainly there will be a legislative problem in connection with the implementation of the study. But as I am sure you appreciate, this was simply a study. So far we do not know what it will cost to build the dams and locks along the lower Missouri and Mississippi, which would be required in order that we may back water from one dam up to the next and then, through a lock, permit them to proceed without keeping a flowing navigation channel.

At this point we are simply investigating the economic feasibility and the desirability of carrying that out.

Senator KUCHEL. Precisely.

All I want to add at this point is that you show an excellent grasp of the problem. I am glad to be here with my colleagues to listen to you.

Representative ANDERSON. Thank you very much, and certainly California has many problems. I have spent many months there.

Senator KUCHEL. We used to shoot to get them settled. Years ago we solved our water problems with guns. Now we go down to the courthouse.

Senator YOUNG. Mr. Chairman, I would like to comment, too, on the very pertinent question you raised, Congressman.

There is increasing opposition downstream for use of any water upstream for irrigation purposes. I have forgotten what percent of the water of the Missouri River originates in Montana, but I believe it is something like a half.

Representative ANDERSON. We thought all of it originated here; maybe not.

Senator YOUNG. We in North and South Dakota have a vast reservoir.

For example, we are losing 500,000 acres. We already have lost 500,000 acres of our best bottomland. If we do not attain some kind of irrigation project out there one day, Garrison Dam will be a net loss to us. We in the State fought for the higher level dam, 1,850, which storage is 23 million acre-feet as against 1,830 feet that was first proposed, all because we thought that would assure us of a supply of water for the irrigation. It is disturbing now to note the opposition downstream from some power interest to any projects that we may want for irrigation.

I believe, properly handled, there is enough water for all of the interests.

Representative ANDERSON. I think there is, but there is not if it is allowed to flow in the 9- or 12-foot channel, just flow out to the sea with no consumptive or productive uses. That is what our committee in the House is hoping, we will find a basis for legislation to correct that present requirement placed upon us, upon us and upon you in North Dakota, to provide that water flowing freely to the sea so they can run their boats up in running water.

Sometime ago one of Secretary Benson's advisory groups on water conservation recommended that there be established in Sidney, Mont., over here just a few miles, a regional soil and water conservation research facility, which would serve this upper Great Plains area. Secretary Benson said——

The CHAIRMAN. Congressman, did you say Sidney was over here a few miles?

Representative ANDERSON. Well, here in Montana it is just a few miles—two or three hundred.

The CHAIRMAN. Very good. I am getting myself oriented.

Representative ANDERSON. We may very well have a breakfast meeting here and you might adjourn your meeting and come there after lunch.

Senator YOUNG. Senator Kerr, I came out to Billings 20 years ago to buy sheep, to drive out a few miles to look at sheep. It was something over 100 miles and they said a few miles.

The CHAIRMAN. I remember the last time I was at Billings. The Governor said we would get up in the morning and drive over here a little way to Kalispell and I remember we left early there that morning and got in there for late supper. I felt at home there because they did not call it dinner.

Go ahead.

Representative ANDERSON. We are very unhappy that Secretary Benson and the administration do not appear to grasp the importance of the optimum development in use of the water resources that we have here in the upper Missouri and they have not moved along this recommendation of his own advisory committee.

The Montana congressional delegation, with the support of the Members of Congress from other States, is pressing for the establishment of this facility at Sidney and it is our hope that your study, Senator Kerr, of the national water problem will help us to prove our case for this facility and to overcome the administration reluctance to spend money—to invest money I should say—to assume our future and the Nation's future.

There are other matters, too, that I would like to call briefly to your attention.

In this immediate area we have been struggling for years to get underway a water project which would yield great benefits both to our agriculture and to our cities.

As to the great Big Horn Dam, sometimes known in these parts as Yellowtail Dam, members of the committee are familiar with the long legislative struggle we had to get this project authorized. Now, because of the unwise no-new-starts policy of the administration, we must apparently engage in an equally long and arduous struggle to get the actual appropriations to start construction of the dam.

Yellowtail, or Big Horn, will supply this valley both with a regulated water supply for agriculture and industrial development and with a large block of electric power which is needed to firm up rural supplies for our REA's, which are going to run short unless we get a new supply of power available to them in the next few years, and to permit industrial expansion in this presently predominantly agricultural and rural economy.

It is a great pity that there are so many in America who put a premium on the status quo and even oppose these investments, and I again emphasize the word "investments," in resources development, investments which will pay their cost many times over in direct as well as in secondary benefits.

This policy has repeatedly brought our great Nation to economic stagnation, depression, and poverty in the past. These policies will do so again in spite of the world challenge to our economic system and to our democratic institutions if they are permitted to prevail and to prevent expansion of our national resources base. And we can expand that base best and most quickly and most economically here in the upper Missouri reaches.

Unfortunately, though, not all of the great investments in our future welfare are quite as obviously self-liquidating as is the great flood control water storage and hydroelectric dam such as that one at Yellowtail or Big Horn.

Moisture conservation work, whether it is in laboratories or out on the land, is an investment that pays real dividends, primarily in increased productivity as well as in savings of waters that would otherwise wreak destruction as it flows down our river valleys. It is not an extravagant and improvident expenditure of public funds as we are repeatedly told.

So despite the fact that this again is an investment, the budget for the Great Plains projects unfortunately was cut again this year and funds available here in drought-stricken eastern Montana have been reduced proportionately.

Because of the composition of this committee and its splendid staff, I am sure your studies are going to bring together and provide us with

a great deal of factual material about our water supplies and future requirements, factual material that is badly needed if we are going to estimate what our future course of action should be, about the absoluteness of very large public and private investment in water projects if our supplies are going to meet our growing requirements, even assuming that we are going to be able to hold this water for our own use here in the upper Missouri Basin.

Valuable as these reports and findings of fact to be made by your committee will be, I think it is equally important that you are now holding public hearings on the subject across the Nation. This is going to make an equally valuable contribution. These hearings are going to stimulate a public discussion and I am sure a public recognition of our water-resources problems here particularly in the semiarid Great Plains States.

These hearings are going to increase public recognition throughout the areas in which you are holding them of the water-projects investments that are badly needed and of the fact—again I emphasize these are investments and not, as they are treated in the budget, current overhead expenditures, the same as any other item of expense—such investments are essential to our continued national welfare and to the continued growth of our national economy if we are to maintain our present lead over the Communists, who certainly are presently threatening to outstrip us in this particular field of natural-resources development, and, more specifically, in the particular field that you gentlemen are inquiring about today, and that is the maximum conservation and utilization of our water resources.

I want to thank you again, Senator Kerr, and gentlemen of this committee, for coming to Montana, to express my appreciation for your stopover in my district, and now to turn you over to the other members in my district who are here today to speak to you, and to yield the floor to them to present to you the views which I am sure will be very cogently and very aptly presented by the other citizens of my district.

Senator MURRAY. Thank you for your able statement. I am sure it will be very helpful to the committee.

The first witness on the list here this morning will be Frank Clinton, regional director, Bureau of Reclamation.

Frank Clinton.

## STATEMENT OF FRANK M. CLINTON, REGIONAL DIRECTOR, BUREAU OF RECLAMATION

Mr. CLINTON. Senator Kerr, Senator Murray, Senator Kuchel, and Senator Young, my name is Frank M. Clinton. I am the director of the Bureau's region 6 in the Bureau of Reclamation.

As members of the committee, you know the Bureau is organized throughout their operating area in the West into seven regions. Region 6 is our northeasternmost region. It covers the northeastern half of the Missouri Basin project of the Missouri River Basin.

It includes all of Montana, east of the Continental Divide, the northeastern half of Wyoming, all of North Dakota, and all of South Dakota, and our power-transmission system extends into the western edge of Minnesota and Iowa.

I would like to devote my time here this morning, Mr. Chairman, to covering only the Montana portion of the Bureau's program and to use this occasion to partly orient the committee on the water program in Montana and the makeup of the stream system and so on as a leadoff for the other witnesses.

In order to do that, I think it will be best if I stand up to the map and point to these locations as they are mentioned.

First it should be recognized that irrigation has been in the past the major use of water in Montana. Practically all the consumptive use of water has taken place in the past by irrigation. Irrigation has been a going concern in Montana for many years, long before the turn of the century, and at the present time there are about 1,800,000 acres in this portion of Montana from the Continental Divide on east under irrigation. Those acres are consuming or taking out of the Missouri River watershed some 3½ million acre-feet a year. Despite that consumptive use, there has still been some 17½ million acre-feet of water passing on an average every year out of the State through the main stem of the Missouri River.

To orient you on the makeup of the upper Missouri River system in Montana, it is made up of the two main drainage systems. That is the main stem of the Missouri, that extends back through Great Falls here on up through Helena and into the so-called Three Forks area. This main-stem portion drains this long reach of the east slope of the Rocky Mountain Range.

Senator YOUNG. May I ask a question at this point?

Do you have any figures of what percent of the waters of the Missouri River originates in Montana, roughly?

Mr. CLINTON. No. I am not good at arithmetic, Senator Young. I will give you two figures.

The average annual flow at Sioux City, Iowa, is about 24 million acre-feet. I mentioned a moment ago there is 17 million leaving Montana, 17 out of 24.

The CHAIRMAN. How far inside Montana does the Yellowstone empty into the Missouri?

Mr. CLINTON. It is just across the boundary, Senator Kerr, at the boundary line.

The CHAIRMAN. Is there any other stream with considerable water flowing east out of Montana that carries additional water?

Mr. CLINTON. No; there is not. This is the main drainage system for the entire eastern portion of the State and it all goes out through the Missouri River.

Senator KUCHEL. The consumptive use of the water for irrigation purposes which is going on in this area, as you suggest for over half a century, is by local conservation districts and I suppose by the Bureau of Reclamation in the operation of its projects.

Mr. CLINTON. That is correct, Senator.

The CHAIRMAN. The reason I asked the question, I was under the impression that the Yellowstone had its confluence with the Missouri in North Dakota?

Mr. CLINTON. It is.

If I remember my geography right, I think it is just across the line here; for all practical purposes it is.

The CHAIRMAN. In view of the fact that the distinguished Senator from North Dakota is here, I thought we ought to have that.

I take it that the 17 million acre-feet includes the flow of both the Missouri and the Yellowstone?

Mr. CLINTON. Yes, sir; that is both. That has been recorded at Williston, N. Dak., which is just a short distance downstream from the State line. The other main drainage basin is the Yellowstone River and it come on up here past Billings and drains all up through Livingston and into the Yellowstone Park country, which again drains very high country, very prolific watersheds.

Of the 17 million down there at the junction of the two, there is a little over 9 million of it comes out of the Yellowstone River. So the two main trunk streams practically divide the total water draining off of Montana and leaving the State.

During the last half century, the Bureau of Reclamation program has been carried on here since the act was passed back in 1902. Some of the very earliest reclamation projects under that act were started and built here in Montana.

They encompass about 300,000 acres. One of the first ones started was the Huntley project here right near Billings. It is right in this vicinity here. It has 27,000 acres in it. It has been a very successful project through the years.

Another early one is the Milk River project, that extends from the mouth of the Milk River clear up here to Havre. It has 15,000 acres in it. The early one was Lower Yellowstone project, with 38,000 in the vicinity of Sidney, Mont. It has been a very successful project.

Another one was the Sun River project up near Great Falls, this large green area here, with some 92,000 acres in it. And the more recent one built during the drought of the thirties and early forties was the Buffalo Rapids project in this vicinity here near Glendive, Mont., with acreage of 23,000 acres.

One comment on those might be worth while.

Here is the gross crop return that has been coming off of those old reclamation projects. As you know, the Bureau keeps crop census every year and, from that 295,000 acres, the gross crop return of 1958 was $13 million and throughout their life, since they were built up until 1958, the total accumulative gross crop return from all of them was $266 million.

Contrast that with the $31 million that it cost to build those.

One other comment I might make at this point is the role of irrigation in this northern climate or in these northern latitudes. I think the old private development in these old reclamation projects have found their role in the agricultural picture in this country. It is largely to supplement and complement the livestock industry.

As you look at this map, there is a terrific amount of Montana that is not irrigated. The irrigated acreage is very small. But all of the rest of the State provides excellent grazing resources for the livestock industry, both cattle and sheep. And the entire crop program on the irrigated areas has been geared to fit in with that livestock industry, mainly to furnish forage for livestock. It is not a cash-crop country. It is not a lettuce or cantaloup or fruit country to speak of.

Back in the late thirties and early forties, it was recognized by the Bureau of Reclamation that we could not continue building proj-

ects similar to these that I have just listed for you and expect the water user to pay the entire cost in 40 or 50 years.

Out of that investigation by both the Corps of Engineers and the Bureau of Reclamation came a consolidated basinwide development plan, whereby the power revenues from all Federal plants built in connection with a water-development program, that those revenues would be pooled and used first to pay off the power cost and, second, to pay irrigation costs, that the water users could not pay.

Senator KUCHEL. By reducing the cost of the water?

Mr. CLINTON. No. They would still pay up to their ability to pay for water and they would pay that through a standard period of 40 or 50 years. And what they could not pay of the construction cost during that period would be charged to power. That would be paid from revenues from the series of Federal plants that were built in connection with the water-development program.

Senator KUCHEL. Is that in operation today?

Mr. CLINTON. Yes; it is.

That whole program was authorized in 1944, in the 1944 Flood Control Act, and the Bureau has been proceeding to build all of the irrigation units under that act ever since.

Senator KUCHEL. So it is not unique to the multipurpose projects in Montana?

Mr. CLINTON. No.

Senator KUCHEL. But a rule you now apply generally across the country?

Mr. CLINTON. Clear across the country.

In that 1944 authorization, there were large numbers of reservoirs and irrigation units authorized throughout the Missouri Basin and the Bureau has proceeded to get as many of those built as we could in the last 15 years.

Let me list what has been built so far.

The irrigation program has been rather small. There has been one built down on the lower Yellowstone. There are about 2,000 acres in it.

One up here near Canyon Ferry, the unit that was built in here for about 5,000. The main emphasis has been to get concentrated on getting the storage reservoirs built first.

One of the first large ones in Montana under that program was the Canyon Ferry Reservoir on the main stem of the Missouri here near Helena. It's a 2 million acre-foot reservoir and has 50,000-kilowatt powerplant at the dam. That reservoir was needed as a regulating reservoir from irrigation development in the Three Forks area to permit irrigation use of the stream below.

Another one that we have gotten ready, that Congressman Anderson mentioned this morning, was the Yellowtail Reservoir. That plays an important link in the water-control program.

Senator KUCHEL. Is that the Yellowtail-Big Horn?

Mr. CLINTON. Yes.

Senator KUCHEL. What is its status now?

Mr. CLINTON. The right-of-way from the Indians was obtained through an act of Congress last year.

The Bureau of Reclamation has done all the preconstruction work on it and is ready to start construction whenever funds are appropriated for the start of the project.

Senator KUCHEL. I think I should point out, since this is a Senate committee, my recollection that the Senate did provide funds for construction which were eliminated in the House of Representatives on that.

Mr. CLINTON. Anyway, the final bill that was passed did not have money in it.

The CHAIRMAN. The Senator's memory is correct.

Mr. CLINTON. We have under construction at the present time under the Missouri River Basin program the Helena Valley unit near Helena, which will serve 17,000 acres.

Among the new starts included in the fiscal year 1960 program, this year was the East Bench unit to Beaver Head River near Dillon, Mont. We are just now getting started on that and it will take us a few years to get that one built. It is a very necesssary and urgently needed project in that area. It involves a large storage reservoir on the stream above Dillon to provide supplemental water for some 30,000 acres in the Beaver Head Valley downstream and will permit the development of about 20,000 acres out here on the bench above Dillon.

Another one we got built in the last 15 years was the Tiber Reservoir on the Marias River. That was built to serve the so-called Lower Marias project. That is the large area in red up here, an area including 127,000 acres of irrigable land. That reservoir was completed a few years ago, but at the time we started to get going on the irrigation works, the landowners in this area decided that they did not want to undertake irrigation at this time. Their main reason was that it is wheat country and they have been getting good rains in that country and good yields of wheat. So they said no.

That development will not proceed unless there is a drought and the landowners change their minds and decide they want to revert to irrigation.

We had another one we investigated in detail and got ready to build, that is the Missouri diversion unit. It is to divert water at diversion dam below Fort Peck and carried out through a long canal to serve some 90,000 acres out in northeastern Montana.

Again, the same landowner reaction was encountered there and active opposition to irrigation developed and the Congress shut that job down before we got the first construction contracts underway.

We have units under detailed investigation.

Getting ready to go is the 44,000 Hardin unit here below Yellowtail Reservoir. It will use storage water from the reservoir when that is built. We are carrying those investigations on so whenever the landowner interest is such that they are ready to go on irrigation, that work can be started during the construction period on Yellowtail Dam or shortly thereafter.

There has been considerable interest in irrigation in the so-called Three Forks area. In addition to this East Bench, the people on down the Jefferson River and through the area around Crow Creek and above Canyon Ferry Reservoir are interested in irrigation. That is a fairly dry country and they have been hit with droughts here for the past few years.

We are investigating in detail and getting ready for construction the project through there that will serve some 40,000 acres of new land and provide a supplemental supply for about 15,000 acres.

In order to regulate the flow properly for that, it is necessary to build a fairly large reservoir on the Big Hole River, what we call the Rickley Reservoir.

In addition to these detailed investigations, there has been considerable general planning work done in the upper Missouri watershed to refinance a lot of the plans that were drawn up pretty sketchily at the time of the 1944 act, at the time this whole entire basin program was authorized.

Among those we sorted over all the plans in the so-called Three Forks area—these three streams, the Gallatin, Madison, Jefferson—to come up with a plan that looked reasonable and that we hoped would be satisfactory to people who owned the land up there and to all the other interests.

We just recently got that report out. And it showed plans for developing some 60,000 acres of new land, these red spots that you see here in that area, and furnishing a supplemental supply to 120,000 acres that is already under irrigation.

There has been some resistance to any further development of these streams for irrigation because of the conflict with fish and wildlife and recreation interests.

You will recall that the Madison River, for instance, is an internationally known trout stream. So at the present time, as you would expect, there would be some resistance to any further use of that stream for irrigation. That is not uncommon anywhere though the Rocky Mountain area, as I guess some of you gentlemen will know.

We did the same thing on the Powder River, both in Montana and Wyoming, and there is a long stretch of small pumping areas along the Yellowstone River that could be developed to a total of 50,000 acres. But that development cannot take place until you get a large storage reservoir at the State line at the Moorhead site in order to regulate that stream.

That Moorhead Reservoir was undertaken, proposed for construction very early in the Missouri Basin program back in the late forties and early fifties. But there was objection because the upper end of the reservoir floods considerable land in Wyoming, and as a result of objections from Wyoming, the start of construction work on that project was delayed.

I think we have done all the planning work that is necessary there for the time being until that interstate problem is resolved.

We are at the present time doing a similar planning job on the entire Yellowstone River itself all the way from Sidney clear back up through Billings and on up to Livingston.

The main job there is to sort over the land, classify the land and find out how much of it is suitable for irrigation. We are not finding too much large volume of land. Most of the development in the future is going to be small pumping plants along the Yellowstone River.

A question to be answered in that is whether additional storage is going to be needed, whether storage will be needed on the Yellowstone River. Remember, at the present time there are no storage reservoirs on the Yellowstone River at all.

It is a large stream and up until now the natural flow of the stream has met all the requirements down the river. If storage is needed, there is a possibility of an economical site being found in this vicinity

near Livingston. There are three or four possible sites that were investigated. There are conflicts on all of them, right-of-way conflicts.

One of the best ones has the main line of the Northern Pacific Railroad and main highway going through it. One trouble is this is one of the gateways to Yellowstone Park. There will be some resistance to any storage development in that region for that reason.

Some of the other areas we have not done as much investigation or enough investigation to say finally what the ultimate development will be. We have gone far enough to arrive at a figure of some 300,000 acres in addition to these I have named for you that may prove desirable to build in the future. They are mostly scattered in small units, such as the ones in this area here and whatever we come up with in the Yellowstone, along the Yellowstone River, and one fairly large development up in this vicinity here around Fort Peck, this large red area known as Glasgow Bench which could be served by pumping from Fort Peck Reservoir.

Altogether in Montana, as we see it now, the program ahead could reach as much as 800,000 acres of new lands beyond the development that exists now. And there is very definitely a need for a supplemental supply for about 250,000 acres for the land that is already irrigated.

Montana is fortunate in having a large supply of water in their stream system, so that our problem has not been total water supply. Some of them require storage, as I mentioned the possibility here on the Yellowstone, and we do need Moorhead Reservoir.

But except for the need for regulation on it, there is adequate water for all of this development as we see it in the future.

If that development is carried out, the consumptive use from it would be about an additional 2 million acre-feet taken out of the river and that would be taken out of this average flow of 17 million.

One of the problems, of course, is the increasing cost of these developments, the ones that have already been built, both the private and the Federal development and all that the State water conservation board has built have, because of good engineering, been concentrated down to the building of the most economical and cheap ones first, which is good engineering, and as we get on out to the future, to build the ones that I have listed here, we are getting into the more expensive developments.

It is taking longer distances to carry the water out to these lands or hire pumplifts and that, along with the continuing cost, is pushing the cost up. All of this future stuff I am talking about cost, which is ranging from 500 dollars a year on up to $1,500 a year.

As those units are presented to the Congress, it will pose some problems on the economic justification of them and to a certain extent, on some of them, the financing.

We have found some that the annual operating and maintaining costs are so high that the landowner cannot pay them out of his return. When we reach that point, we are reaching possibly the point of infeasibility, or very definite infeasibility.

I think that concludes my presentation, generally, to orient the committee. I am available for questions.

The CHAIRMAN. Thank you very much, Mr. Clinton.

Senator Murray?

Senator MURRAY. Are there any questions by the committee?

I have no questions.

Senator KUCHEL. Senator, I would like to ask this: Does the Bureau have any treatise on the law which might be applicable to the use of waters of an interstate stream?

Mr. CLINTON. I don't recall any as such.

There has been an awful lot written on it, Senator, as you well know. I cannot recall any special treatise on it, though.

Senator KUCHEL. I was wondering whether you recall that any inquiry from a strictly legal point of view might have been made by your solicitor. If so, I was going to ask that you get a copy of it for us and let us have it in the record.

Mr. CLINTON. I can't recall one right now.

Senator KUCHEL. Thank you.

Thank you, Mr. Chairman.

Senator MURRAY. Does that conclude your testimony, Mr. Clinton?

Mr. CLINTON. Yes, it does.

Senator MURRAY. Thank you very much for your very able statement.

The next witness will be Hon. Carl J. Clavadetscher, mayor of Billings, accompanied by Edward Waldo, city water manager.

## STATEMENT OF HON. CARL J. CLAVADETSCHER, MAYOR OF BILLINGS; ACCOMPANIED BY EDWARD WALDO, CITY WATER MANAGER, BILLINGS, MONT.

Mr. CLAVADETSCHER. Senator Kerr, Senator Murray, Senator Kuchel, Senator Young, Congressman Metcalf: I am Carl J. Clavadetscher. I have the honor of being the major of Billings and I am not an authority on water resources. However, I have lived in Billings practically all of my life.

I would like to point out just a very few things to you which Mr. Waldo will go into greater detail on.

Forty years ago Billings was a semirural community, a trading center of about 15,000 people. Based on conservative estimates and on past records of growth, in another 40 years the city of Billings will be in excess of a quarter of a million people.

Senator KUCHEL. When did you say?

Mr. CLAVADETSCHER. By the year 2000; in another 40 years.

We have no acute and pressing problems at the present time relative to our water insofar as we know it now of the Yellowstone River, with the exception of possible pollution problems and probably we are one of the chief offenders ourselves. But I would like to point out that as Senator, you already noticed we have a big State here—hundreds of thousands of square miles of land and a population in that entire State roughly comparable to that of Seattle, Wash. We have a lot of room to take care of this expanding, this explosive population. We don't have much water.

We appreciate your interest in our problem and I think I am speaking without any reservations or qualifications for all of the water-hungry Westerners, that we appreciate your interest and we are confident that our future is in good hands.

At this time I would like to present Mr. Waldo, if there are no questions.

Senator KUCHEL. I would like to say this: The type of statistic that you just gave, I think is important. It probably can be duplicated all across the country.

I asked one of the staff members here, my colleagues and ladies and gentlemen, if my recollection was correct that a water engineer said in the next 25 years the city of Washington, D.C., our Capital, would require all the water in the Potomac River. It would be absolutely dry. And surely with a prophecy of 250 million people in this country by 1980, and with an increase in the use of water by 50 percent, this it seems to me to be the crucial basic problem that our country at home faces.

We ought to have that kind of estimate because the people are going to come to Montana. They are going to come to these other States. They have been attracted to my State. There is not too much more roo.n there. We have a water problem and a big one, but so have you; and to plan in advance as we need to do now, I think gives us a chance to do a little statesmanlike business in Government.

Mr. CLAVADETSCHER. Thank you very much, Senator.

I would like to point out that substantially the greatest percentage of the population in our State is located right along the Yellowstone and the Missouri Rivers. People have to have water and we trust you will take care of ours.

Thank you.

Senator MURRAY. You may proceed, Mr. Waldo.

## STATEMENT OF EDWARD R. WALDO, MANAGER, BILLINGS WATER DEPARTMENT, AND VICE CHAIRMAN, MONTANA SECTION OF THE AMERICAN WATER WORKS ASSOCIATION

Mr. WALDO. Mr. Chairman and members of the committee, thank you.

I am Edward R. Waldo, manager of the Billings Water Department, and in addition to that I am the vice chairman of the Montana section of the American Water Works Association. I am also chairman of the Montana Sewerage and Industrial Waste Association.

Those two organizations have the same interest as the city of Billings.

The city of Billings, Mont., has been very fortunate to have the Yellowstone River practically at its doorstep. When treatment and distribution facilities have been adequate, the city has always had an ample supply of water for domestic, commercial, and industrial usage.

Many cities have had to go a long way from the city limits to secure a dependable year-around supply. Of the larger cities, New York and Los Angeles are prime examples, with New York going into the Delaware River drainage area for additional supply and Los Angeles securing part of its supply from the Colorado River. Southern California is short on water and the State has started a huge project to bring water from northern California to southern California.

Billings has water for its future development, but any planning in regard to the water resources of the area must include an allowance for the domestic and industrial growth of the city.

As the population density of the United States increases, more and more people will move to areas that are less congested. The residents of the large cities are trying to get into the suburbs now and this trend will probably stimulate the development of the sparsely settled Rocky Mountain area. Once a community grows to about metropolitan status, it seems to grow on itself and doesn't need any major upheaval to continue its growth.

Billings was given the necessary boost by the oil industry to place it in the class where it will grow by itself. The past growth of the city has been fabulous, as shown by the following figures: 1920, 15,100; 1940, 28,766; 1959, 70,000.

Projecting these figures into the future at a slightly higher rate than the national average, we arrive at the following figures: 1980, 140,000; 2000, 295,000.

Another factor that has to be taken into consideration is the increased per capita consumption of water. People aren't necessarily cleaner than they used to be, but they use more water in automatic washers, garbage grinders, and other appliances than ever before. The trend to larger yards and more lawn area has increased the requirements for lawn sprinking.

The water demand rate in Billings is about 163 gallons per capita per day and the national average has been increasing at the rate of 5 gallons per capita per day per decade, which would indicate that Billings would have an average demand rate of 175 gallons per capita daily in the year 2000.

The CHAIRMAN. How much is it now?

Mr. WALDO. It is about 165,000.

The CHAIRMAN. And increases 5 gallons per capita per decade?

Mr. WALDO. Per decade; yes, sir.

The CHAIRMAN. How much would it be in four decades?

Mr. WALDO. It would be 185, sir.

The CHAIRMAN. I believe it would—what did you say?

Mr. WALDO. I said 175.

The CHAIRMAN. That is all right.

Mr. WALDO. That is for the correction.

The CHAIRMAN. I do not have the benefit of a technical education; neither am I limited by one. But I just wanted to get that.

Mr. WALDO. I guess I am not very good at arithmetic itself. I will join Mr. Clinton.

Estimated water requirements for the city of Billings would be as follows: 1960, and that is practically at the present time, 4,250 million gallons; 1980, 8,942,500,000; 2000, 19,919,875,000.

The CHAIRMAN. That 19 billion is for the year, I take it.

Mr. WALDO. For the year; yes, sir.

This storage is usually less than 1 day's requirements. The maximum pumping rates could be: 184 million gallons per day in 1980; 287 million gallons per day in 2000.

In this area the industrial consumption that is separate from the city system has increased considerably in the last few years.

For many years the only major industry that had a separate water supply was the Great Western Sugar Co. Now we have the Carter Oil Co. and the Montana Power Co. The water now used by these three industries is approximately three times the total city demand.

Any planning should allow for a considerable increase in the demands for industry.

Planning for a volume of water to be available at some future date is not the only problem that should be considered. The quality of the water is also of major importance. As industries grow and population increases, the hazards of contamination of the public water supply become a serious problem. Adequate controls are necessary and must be enforced in order to keep our rivers an appetizing source of water.

With proper planning of water resources, the city of Billings can expect considerable growth in the future without water becoming a problem.

### MONTANA MUNICIPALITIES AND WATER RESOURCES

The problems of other municipalities in Montana are somewhat different from the problems encountered by Billings. Many of the towns do not have a large stream of water anywhere near their location. They have to depend entirely on well supplies. Seventy percent of the municipalities in Montana rely entirely or in part upon wells for their supply system.

This 70 percent includes approximately one-half of the urban population in the State.

Senator YOUNG. How deep are those wells? How deep do they have to go?

Mr. WALDO. That varies considerably. I don't believe I could give you a very good figure as to the depth of those. In this area here we don't get very good water at any depth. They can get water at varying depths, but none of it is very satisfactory.

Senator YOUNG. Can you get a pretty good supply from some of these wells?

Mr. WALDO. In some cases. In some of the valleys in the State there is a very good well supply available. In other areas, it is very limited.

Senator KUCHEL. Where did you say you get your water for the city?

Mr. WALDO. From the Yellowstone River.

Senator KUCHEL. Just generally, what is the law of Montana?

Is it beneficial use theory so when you appropriate water for beneficial use, you acquire a right to that amount?

Mr. WALDO. Yes, I believe that is substantially correct.

You have to file, of course, the water right and then you are supposed to use it. Of course, in the case of your municipality, you have to have a special provision there so that you can have available what you need.

Montana ground water supplies as a general rule have very high concentrations of dissolved salts. Many well waters are completely unfit for municipal usage.

One of the big problems is the development of cheap methods of removing these salts from our underground water resources.

Most of the larger municipalities secure their supply from large streams and rivers adjacent to their location. Underground water supplies are usually not contaminated but the cities and towns using surface water are concerned with the pollution of their supply.

One source of pollution is the sewage from other urban centers further upstream. A good deal of progress has been made, and a lot of credit must be given to section 6 of Public Law 660 for providing grants to assist communities in the construction of sewage treatment facilities. In Montana we have 62 sewage treatment plants serving a population of 114,000, according to the 1950 census.

Fifteen more cities, having a population of 92,000, have construction of adequate facilities already underway or they have completed preliminary planning for the construction of adequate facilities. There are only 13 communities that have no treatment but it is anticipated that this situation will be taken care of in the near future. Time, education, and a little prodding will complete the job.

Industrial pollution of our surface water is a much more complex problem. Oil refineries, beet sugar processing plants, packinghouses, smelters, mines, and pulp mills all create problems in the disposal of their waste products. As the industrialization of Montana progresses, we will have new industries coming into our State. These may bring additional problems, but continued investigation, research, and control will keep our industrial pollution under control.

The water pollution council and the State board of health are to be commended for the excellent progress they have made on pollution control in Montana. They have shown that with competent personnel and adequate laws, pollution can be controlled.

Somewhere recently the words "water, wealth, or worry, America" appeared in print. Let us all be sure that water, our greatest natural resource, remains as pure as possible.

In the case of the surface water supplies, the turbidity decreased by erosion control, the coliform bacteria decreased by sewage treatment and chemical pollutants decreased by industrial waste supervision. Our ground water may be made more usable by efficient salt removal.

All of these things are necessary in order to make efficient use of our water resources.

Proper planning for the use of water, whether it be irrigation, industrial, domestic, or recreational, will provide plenty of water for all of us and our children.

Thank you, gentlemen.

Senator MURRAY. Thank you.

The next witnesss will be Mr. D. P. Fabrick, representing the Montana Water Conservation Board, and chairman of Montana State Planning Board.

## STATEMENT OF D. P. FABRICK, OF CHOTEAU, MEMBER, MONTANA WATER CONSERVATION BOARD, AND CHAIRMAN, MONTANA STATE PLANNING BOARD

Mr. FABRICK. Senator Murray and members of the select committee, I haven't a very long statement to make. It will take about 5 or 6 minutes to read.

First of all, I would like to express our appreciation for the evident deep interest of the members of Congress in national resources development.

During the last session of the Congress, 37 measures were introduced involving general provisions of Federal statutes on subjects of general

water policy, procedure, Federal, State, and local cooperation, authority of agencies, cost-sharing standards, and many other important subjects.

In addition, 9 other measures were introduced dealing with various aspects of recreation and 3 measures dealing with wilderness preservation, 6 dealing with pollution problems, and 11 dealing with such subjects as project feasibility, excess lands, power reserves, repayment, delivery of water, and operation and maintenance; a total of well over 50 separate measures.

We especially appreciate the work of the Senate select committee. Its report, based on exhaustive nationwide studies, may well be of basic importance in solving many of the current problems dealt with in the many measures mentioned above.

I appreciate the opportunity to appear before your committee. There may be little need of my appearance before you, because the committee will receive reports and information from all pertinent Government agencies on every phase of water conservation and use.

However, I would like to use this opportunity to briefly refer to a few current matters related to irrigation in Montana and the Missouri Basin that may not be covered in those reports.

First of all, I would like to say something about the importance of irrigation. There are conditions in any program including many other important uses for water.

Reports will be submitted to the committee that will show the size of the now foreseen program for new irrigation development in Montana by Federal, State, and private undertaking.

The program in the Missouri Basin portion of Montana is estimated to require a diversion of about 3,500,000 acre-feet of water annually for 850,000 acres of new land and 275,000 acres of irrigated land requiring supplemental water. This development would result in a depletion of about 2 million acre-feet per year, which includes evaporation losses. That is 2 million acre-feet out of the 17 million that you have heard about that leaves the State at the Montana-Dakota boundary.

In addition to agriculture or irrigation requirements, greatly increased quantities of water will also be needed for municipal, industrial, and recreational uses.

In fact, how Montana progresses in the future depends to a large extent upon the water we have and how we use it.

We should recognize, however, that agriculture is our most important source of income, and that in our semiarid climate we need to irrigate more and more of our land. In this way we shall bring greater stability and growth to our predominant agricultural business, and will also effectively promote the growth of many dependent industries, such as manufacturing, transportation, trade and services, public utilities, and finance.

Montana's economic growth and that of the other semiarid States of the West has been retarded by the scarcity and uncertainty of rainfall on the land. The best way to correct the resulting economic instability is by putting our surface and underground water supplies upon the land. Of course, I do not mean to imply that our semiarid lands have any exclusive right to the future use of our limited water supplies.

However, and this I wish to emphasize, since our semiarid climate is the basic handicap to our agricultural stability, irrigation for the present, and for a long time to come, has a place of first importance in a well-balanced program for all beneficial uses.

I would like to say a few words about our State reclamation program, gentlemen.

A sizable program of small irrigation projects has been successfully and economically carried out by the State water conservation board. Under this program an adequate water supply has been furnished to 350,000 acres of land. That is during the last 20 years or so.

The program represents a good demonstration of State initiative and enterprise. Under this program, the entire construction cost is being repaid by the water users. Unlike the Federal program, no part of the construction cost, in the past or up to now, is being repaid from power revenues, and none is being allocated as a nonreimbursable expenditure for benefits to fish and wildlife, navigation, flood control, or recreation, and I believe it is desirable for this State or any State to have a program of that sort carried on by the State.

To carry on in the future, it will become necessary to apply such nonreimbursable costs to State programs like that of the Montana Water Conservation Board, or to pay part of the cost from power revenues.

I wish to say something now if I may, about the Missouri Basin program that was authorized in 1944 and about one of its important provisions with reference to a Missouri Basin account.

Since 1944, the program of the Bureau of Reclamation in Montana has been carried forward as part of the Missouri Basin project, together with the Federal reclamation program in the other States of the Missouri Basin.

Under the provisions of the Flood Control Act of 1944, that part of the construction cost allocated to irrigation that cannot be repaid by the water users is being repaid from net power revenues credited to the Missouri Basin account.

The full development of our semiarid States requires both irrigation to stabilize our agricultural economy and power development for industrial growth. It is only through the operation of the Missouri Basin account that our rivers can give us both of these benefits.

The operation of the basin account is a logical, sound, practical, and highly successful arrangement. Only through the operation of the basin account can our States have the two economic essentials of agricultural stability and industrial growth, and only through it can the Federal Government be fully repaid for the cost of both power installations and the cost allocated to irrigation.

Without the Missouri Basin account, such new projects as the Helena Valley unit, the East Bench unit, and the Hardin unit, all in Montana, would not be feasible.

The Missouri Basin account has been in successful operation for 15 years. We strongly urge that the integrity of the Missouri Basin project as authorized in 1944 be upheld, and that we shall not step backward by considering the units of the Missouri Basin projects as separate undertakings, as was done prior to 1944.

The operation of the Missouri Basin account is very similar to the basinwide operation of basin accounts in the upper Colorado project

and in the Central Valley of California. It is partly in operation in the Columbia Basin also, but not on a basinwide scale. So we also hope that the legislation introduced by Senator Murray and others to establish the Pacific Northwest account for the Columbia Basin will be passed by the next session of Congress.

Under the provisions of this legislation, Montana will participate in the benefits from this fund on the basis of our contributions to the Columbia Basin power system in the form of water and of power generation.

I have two more little matters, Mr. Chairman, that I would like to very briefly mention, and they have to do with pollution control and navigation on the Missouri River.

When we think of the economic needs of the semiarid Great Plains region, of which Montana is a part, we recognize first of all the basic problems of bringing more stability to its agriculture and to advance its industrial development. Both of these problems require that we make the fullest beneficial use of our water resources. For such maximum beneficial use, it is necessary that we protect the quality as well as the quantity of our water supplies.

Presently we are not utilizing the water stored in the reservoirs on the main stem of the Missouri River to the best advantage to get maximum beneficial use. Presently we allow water quality, which means water usefulness, to be damaged by pollution from human and industrial wastes. Then we try to correct the harmful and wasteful effects of pollution upon the usefulness of our water supply, by a secondary wasteful practice, when we make releases of large quantities of stored water to abate pollution.

It is plain that we cannot approach optimum beneficial use of our Missouri River water supplies, as long as excessive pollution of the river continues.

We should therefore give strong support to the program of the Department of Health, Education, and Welfare to control pollution by treatment of human and industrial wastes before they reach the stream. This will preserve a better quality of the main-stem flow for greater beneficial use and will conserve large quantities of reservoir waters for constructive beneficial use rather than have them released to abate pollution.

Senator KUCHEL. If I may interrupt just for one question.

Mr. FABRICK. Yes, sir.

Senator KUCHEL. However, there is the element of control in any such antipollution problem. I take it you would not want the Federal Government to participate and you would want the legislation in the field of control or elimination or prohibition of pollution to be under State jurisdiction; or would you?

Mr. FABRICK. The State is actively cooperating with the Federal Department of Health in the pollution control.

Senator KUCHEL. Through grants and loans to municipalities or other districts?

Mr. FABRICK. That is right.

Senator KUCHEL. I mean I do not want to belabor the point, but I wondered whether you were suggesting that there should be a national law prohibiting or purporting to prohibit pollution or its control?

Mr. FABRICK. I am under the impression that there is a national pollution-abatement or pollution-control law.

The CHAIRMAN. With reference to interstate waters?

Mr. FABRICK. Yes.

Senator KUCHEL. Only?

The CHAIRMAN. Yes.

Mr. FABRICK. We also have pollution-control law in the State under a State program of pollution control.

Senator KUCHEL. It is similar to the interstate-stream regulation?

Mr. FABRICK. They dovetail together and the programs do. They are cooperative programs.

As in the case of pollution control, we want to make it emphatically clear that we also support and will cooperate in measures to improve and extend navigation.

The CHAIRMAN. Would you read that sentence again?

Mr. FABRICK. Yes, sir; I will be glad to.

As in the case of pollution control, we want to make it clear that we also support and will cooperate in measures to improve and extend navigation.

However, the present type of run-of-the-river navigation requires releases of great quantities of reservoir water, much greater than would be required by slack-water navigation. We therefore urge that studies and investigations be made of the practicability of slack-water navigation on the Missouri River.

The CHAIRMAN. That would be the utilization of the increased number, of course, of locks on the channel and the maintenance of water above those locks rather than the constant flow of the water in order for the navigation channel to be in existence?

Mr. FABRICK. That is right, Senator.

The CHAIRMAN. Have you made an estimate, or has there been one made, of how much less water would be required in the navigation program of that specification than in the one currently contemplated or operating?

Mr. FABRICK. Senator, in the studies of adequacy of water supply of the Missouri River, the quantities are named. I cannot state them at present or at the moment.

Large quantities are now being released to aid navigation. As to the difference between those quantities and those that would be needed for slack-water navigation, those differences would be very great because the requirements of slack-water navigation will be very small. It would be difficult to get figures on that. But I don't have them. I don't know as they have been made.

The CHAIRMAN. I wonder if the Reclamation Department has those figures or if they could be obtained by the Reclamation Department for this record?

Mr. CLINTON. Mr. Chairman, we don't have them here.

The CHAIRMAN. Is there a representative here of the Corps of Engineers?

Mr. CLINTON. I am sure the Corps of Engineers could supply them.

The CHAIRMAN. I am sure they could.

Mr. SEIBERT. I am Frank Seibert, of the Missouri River Division office.

I think that some figures of that nature are available, but it might be interesting to note that the report I read on the operation of the main-stem system for the last month reported that every bit of water

that went through the main-stem dam was used to produce power with the exception of a small quantity that was used for testing, about 1,500 acre-feet; a very small quantity.

The CHAIRMAN. I am sure that that is correct.

I certainly have no criticism of the method of operation of the corps. It is our job to get information.

Mr. SEIBERT. Yes, sir.

The CHAIRMAN. I think at this point in the record, it would be very pertinent if a statement could be placed into the record by the corps which would show—

No. 1, the difference in the volume of water required for navigation as authorized and as it is proposed by the witness and others who have testified here, and also the effect that reducing it would have on the power program.

The statement referred to is as follows:

STATEMENT BY CORPS OF ENGINEERS ON WATER REQUIREMENTS FOR SLACK WATER NAVIGATION AND EFFECTS ON POWER PROGRAM

At the Billings, Mont., hearing of the Senate Select Committee on National Water Resources on October 9, 1959, the chairman requested that the Corps of Engineers place in the record a statement on the difference in the volume of water required for navigation as authorized and with a slack water project, and the effect of this difference on the power program.

The slack water navigation study was authorized by congressional resolution during the past session, and only preliminary planning has been begun. Therefore, the necessary studies and data have not been developed to serve as a basis for a complete reply to the questions raised.

There are many complex and closely interrelated technical problems involved in the design of a slack water navigation project for the Missouri River which can be resolved only by the analyses that will be undertaken in the course of the recently authorized study. The major technical problems in developing a slack water system for the Missouri River involve the development of a suitable channel for navigation which will have the necessary capability to move sediments and still retain adequate capacity for safely passing flood flows. Some of the more important elements in the capability to move sediments adequately include the consideration of channel configuration, and the total annual releases from the main stem system and their seasonal distribution. Resolution of these factors will require careful detailed analysis and will form one of the basic undertakings in the slack water studies. Consequently, the downstream water requirements for a slack-water project and the resulting effect on the potential generation of the main stem powerplants can not be fully determined at this time.

Another factor having a bearing on the releases that would be made from the main stem reservoir system with a slack water project, is whether the studies indicate feasibility of including power in the low head dams of the project, as many proponents have visualized. If found practicable, then during years of normal, and particularly during years of subnormal water supply, it would be highly desirable to maintain releases from the main stem reservoir system at the highest practicable rates to enhance power generation at the downstream run-of-the-river powerplants of the slack water system. The heavy ice cover which forms on the Missouri River in the Dakotas and downstream as far as Omaha each winter also has an important bearing on seasonal distribution of water releases from the main stem reservoirs. This ice cover reduces the safe discharge capacity of the river channel substantially below the same channel discharge capacity in the ice-free seasons. Thus, in years of near normal or greater runoff, the total volume of water to be discharged down the river each year, once the main stem reservoirs are initially filled, will exceed the safe winter discharge flow rate under ice conditions and necessitate higher discharge rates during the ice-free seasons for safe disposal of the excess water.

Although not serving as a direct reply to the questions raised by the Chairman on the effects of the downstream slack water navigation project on the main stem power generation, the report of the MBIAC Subcommittee on Com-

patibility of Power and Navigation serves as an index to the limit of the potential effects. This report was presented by the chairman, Mr. Kenneth Tower, regional engineer, Federal Power Commission, Chicago, Ill., to the Missouri Basin Inter-Agency Committee at its September 17, 1957, meeting in Helena, Mont. The bases for the studies leading to the findings presented in this report were that service to downstream navigation would be suspended entirely, and that the main stem reservoir system would be operated to provide the same level of benefits to the other basic functions of flood control and irrigation, and then to maximize the power benefits. Mr. Tower reported that:

"* * * If navigation is ignored, the kilowatt output of the main stem plants to which a unit capacity value can be ascribed would be increased in a range of from 40,000 to 270,000 kilowatts, depending upon the assumptions made for operation during the early years of a recurring drought period. Furthermore, it is expected that the average annual energy would be increased no more than 75 million kilowatt-hours, which is approximately 1 percent of the average annual generation. Evaluating these added quantities on the basis of $25 per kilowatt-year and 2.5 mills per kilowatt-hour, we find that the average annual power benefits are increased in the range of from about $1 million to $7 million. Thus the effect of operation primarily in the interest of power is to increase total power benefits above those with navigation in a range of from about 2 to 10 percent."

Since the foregoing report was predicated on no service to navigation and since it is reasonable to expect that the findings of the forthcoming slack water study will develop the need for at least some water service to the navigation project, it appears that the increase in power benefits for the upper main stem reservoirs resulting from a slack water project would, in any case, be less than that indicated by the foregoing report.

The CHAIRMAN. And I would like to request the Bureau to make a very brief statement containing their comments on the proposal so that it might be in this record at a point where the various viewpoints, together with information that is pertinent, would be readily available both to the committee and others who might read this record.

U.S. DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
*Washington D.C., December 3, 1959.*

HON. ROBERT S. KERR,
*Chairman, Select Committee on National Water Resources,*
*U.S. Senate, Washington, D.C.*

DEAR SENATOR KERR: At the hearing held by the Select Commitee on National Water Resources at Billings on October 9, 1959, you requested the Bureau of Reclamation to make a brief statement giving our comments on a proposal for slack water navigation on the Missouri River.

Fundamentally, adoption of slack water navigation should reduce the amount of water required for this purpose and permit greater flexibility in regulating water for other uses. With this flexibility, increased consumptive use might be permissible in the upper basin, and there could be greater opportunity for meeting downstream requirements, including power production.

Power production may be improved at the existing installations and augmented further if powerplants are included in dams added in the slack water scheme. Firm power production will be influenced by the future load patterns. Although the system firm power peak now occurs in the winter period, when water is being conserved for summer releases for navigation, there is no assurance this will continue in the future.

To evaluate properly the merits of slack water navigation requires thorough study. Any change in plans from free flowing to slack water navigation would entail the solutions to many associated fundamental problems, including power, icing conditions, sediment, pollution abatement, and agriculture. We believe there may be a possible overall advantage in slack water navigation, probably attainable at high cost, but such a study is required before the question now being asked can be adequately answered. The study, of course, should be made by the Corps of Engineers, which has primary responsibility for development of navigation.

Sincerely yours,

WILLIAM I. PALMER,
*Acting Commissioner.*

Senator YOUNG. Mr. Chairman, if I might be permitted a statement now, the great reservoirs in North Dakota and South Dakota now furnish a lake that reaches clear across the State. About all you would have to have for navigation now would be locks, and it would require no additional water at all, as I see it.

I think the testimony of the witness here is that for an area like Montana, North Dakota, and South Dakota, it is two ways. We must have the railroads. They are a vital necessity here. We need the water for navigation. If priority is given for navigation downstream, we not only lose the water but our freight rates are automatically increased.

Any place where you have water competition, the railroads have long ago established lower rates and they have to make their income by increasing the rate in the interior where there is not any water competition.

The CHAIRMAN. I am not so sure of that, Senator.

My own conviction about that is, and I certainly do not want to get into any kind of argument with one of the dearest friends I have, but my conviction about that is that the railroads make that up by the increased traffic at the lower rate. You know the greatest railroad systems in our country, aside from the magnificent transcontinental lines, are in the highly industrialized areas adjacent to navigation. Take the Pennsylvania Railroad, the New York Central, the Chesapeake & Ohio, they have no areas that they serve which is noncompetitive with water transportation, and yet they have a long record of successful operations.

Senator YOUNG. I think the St. Lawrence Seaway is a good example of the point I am trying to make.

Since the St. Lawrence Seaway was open, the railroads serving that area in competition have reduced their rates by about 20 percent. When they reduced the rates there, they certainly are not going to increase business. They are going to hold their own. They are holding their own. To show a profit, they invariably increase the rates back where there is not competition.

The CHAIRMAN. I think you find railroads competing with the St. Lawrence Seaway have no other areas in which they could raise their rates, generally speaking.

Senator YOUNG. Possibly not. Their freight rates on grain, for example, and railroads serving this area has constantly increased. They have lost the livestock business.

The CHAIRMAN. Surely.

Senator YOUNG. For the most part.

But grains have gone up. The cost of shipping a bushel of wheat now from Bismarck, N. Dak., to Buffalo, N.Y., is 70 cents, which is almost prohibitive.

The CHAIRMAN. I think the day will come when the forward-looking people of your great area led by such men as yourself will seek to find the possibilities of navigation into your State that would not be a consumptive user of water, but a beneficial user of it while its consumptive use would be left to other purposes.

Senator YOUNG. I think that would be one of the answers.

I noted right from the start of these hearings we always get into this question of priority of our water uses. I imagine that will be the pattern all the way through.

The CHAIRMAN. I am not trying to in any way anticipate the settlement of the conflict as to priority. I do not believe that is our function, but I feel that those who do have that responsibility will be better able to do so if we have a broad scope of information in our hearings.

And while I am on that, I am tremendously interested in the information we have here as to the flowage of the Yellowstone and the Missouri out of Montana and into our great sister State of North Dakota, and, of course, the flowage of the Missouri is augmented by that of the Little Missouri, which comes in from Wyoming, Montana, and South Dakota.

Senator YOUNG. In Dakota, too.

The CHAIRMAN. I mean, though it flows into North Dakota, and, of course, accumulates water there, and goes into the Missouri.

I just would like to have for the record the flowage of the Missouri, the Yellowstone, and the Little Missouri into North Dakota and then the flowage of the Missouri out of North Dakota.

Senator YOUNG. Mr. Chairman, if you want to get a true picture, you have to go farther down.

The James River drains a large area of North Dakota and empties into the Missouri way down in South Dakota. Actually, about two-thirds of the drainage of North Dakota empties into the Missouri River, over half, at any rate.

The CHAIRMAN. I think the breakdown of augmentation of the flowage below Garrison Reservoir would be very helpful.

Senator YOUNG. Yes; it would.

The CHAIRMAN. I wonder if the Bureau would undertake to put that into the record.

Mr. FABRICK. Mr. Chairman, I think your record already has that information.

The Governor has submitted to the committee a report from his office that was prepared by the State engineer. It has a complete tabulation of the flowage of the Missouri and of the Yellowstone in North Dakota, including the flowage of Little Missouri River from Wyoming into Montana and into Missouri, and also a breakdown of water that comes in the drainage basin of Montana from Canada and Wyoming. It has the same information.

The CHAIRMAN. Has it below Garrison Dam?

Mr. FABRICK. Not below Garrison Dam. The water that flows out of Montana.

The CHAIRMAN. Whose report has that information?

Mr. FABRICK. The State engineer's report for the State of Montana that has been transmitted to you. I believe you have already received it, or the committee has, by the Governor, by Governor Arens.

The CHAIRMAN. That is fine if we already have that information. I had not heard it given here this morning.

Mr. FABRICK. I could show it to you. I have it here with me, I believe.

The CHAIRMAN. I would be very happy for us to have that in the record; and in view of the fact that this entire area is, I believe, in the district of the Bureau, I am sure they would have that information. Do you not, Mr. Clinton? Do you have that information?

Mr. CLINTON. Yes; we can, Mr. Chairman.

I might make a suggestion on this point that the Geological Survey is the agency of the Department of Interior that does all the gaging of rivers throughout this basin, all over the West.

The CHAIRMAN. I would not object to you getting the information either from the Geological Survey or the report of the Governor of Montana. I do not want to generate any conflict of interest between any agencies. I just would like to get it into the record.

Mr. FABRICK. At this particular point, Mr. Chairman?

The CHAIRMAN. Oh, no. But in the hearing that we have here in Montana.

Mr. FABRICK. I will see that it is supplied.

The CHAIRMAN. Thank you, sir.

Mr. FABRICK. Today.

I have just one closing statement to make, Mr. Chairman, that modern sewage treatment and slack-water navigation on the Missouri River would greatly add to the maximum of beneficial use that the future will require of the water resources of the Missouri River system.

Thank you.

Senator MURRAY. Thank you very much for your very able statement, Mr. Fabrick.

The CHAIRMAN. I want to thank the witness, Senator Murray, for a very informative statement and for a very provocative, and I believe constructive, approach.

I would like to say that insofar as I am concerned, I am hopeful that the work of this committee will result in the compilation of a great mass of pertinent information and data and that this committee will be the vehicle of transmission of that information to many who are both interested and with great responsibilities.

I would not be entirely frank if I did not acknowledge that I expect to be one of the principal beneficiaries of it myself.

Mr. FABRICK. We all will be, Senator.

Senator KUCHEL. May I ask you a question?

Mr. FABRICK. Sure.

Senator KUCHEL. Can you indicate what the small irrigation project law is in your State of Montana—what it provides as to the ceiling, the amount of money that is available to a small project, and what the State offers under that to a conservancy district?

Mr. FABRICK. We have no conservancy district in Montana, Senator. We have no conservancy difficulties enabling legislation.

Senator KUCHEL. I misunderstood you then.

Mr. FABRICK. We have, however, irrigation district and water users associations that manage and operate these projects. We have no financial ceiling established under our program, but generally speaking, these 350,000 acres comprise perhaps 15 or 20 fairly good sized projects, up to a size maybe of a few thousand acres of land and perhaps a million dollars of cost.

But anything bigger than that, we, in cooperation with the Bureau always decide it would be better included in the Bureau program than in the State program.

At the same time, when the Bureau has small proposals or small projects under consideration, they consult with the water board and between us we make a decision of what would be most practical and most economical to finally develop it as a unit of a Bureau project or as a unit of the State project.

Senator KUCHEL. If it is a unit of the State project, then actually what does an irrigation district receive from the State under this law?

Mr. FABRICK. The State will finance the construction project and they will make contracts with all the individual water users to repay each man's share of the construction cost based on the amount of water that he is purchasing.

Senator KUCHEL. What kind of a project would it be? Would it be a dam and reservoir, a multipurpose project?

Mr. FABRICK. No; sometimes it is a reservoir and storage project and sometimes it is a direct diversion from a stream, just an irrigation ditch.

Senator KUCHEL. Is there any provision for the power that would be required by the members of the irrigation district or do they then make their own arrangements with respect to pumping?

Mr. FABRICK. No; we only have one or two projects where there is any pumping or any electrical power is required.

You mean the authority of the irrigation?

Senator KUCHEL. Yes. I was wondering whether your State authority under this law of which you speak can contract to furnish the power as well as the water to an irrigation district?

Mr. FABRICK. The projects belong to the State of Montana. The water users associations, or rather the members, the individual members of the water users associations, locally, make a contract with the State to purchase I will say 500 acre-feet of water for maybe 200 acres of land that the farmer, Mr. Jones, owns. And he agrees to pay 50 cents or a dollar or $1.25 toward the construction cost of the system. He also agrees to pay his share of the operation and maintenance cost. Then when he has fulfilled his contract at the end of 20 or 30 years of having paid his share of the construction cost, he has a permanent water right.

The arrangement also provides that the local water users associations operate and maintain this project under the supervision, of course, and in cooperation with the water board when they get into any difficulty or so. But they are operated by the local associations, as soon as possible and to the fullest extent possible.

Senator KUCHEL. Does you State own any multipurpose projects in the State?

Mr. FABRICK. No, not insofar as you mean there is no power generation included in any because there is no opportunity for it, not particularly as a policy perhaps, but just as a matter of practicality.

Senator KUCHEL. Over the history of the last 50 years of the Bureau supplying the projects, I suppose?

Mr. FABRICK. Now, for instance, in the cases of a diversion from a stream, there is not enough fall of water anywhere or enough quantity of water that would justify power generation or any kind of installation of that sort.

Senator KUCHEL. What I was wondering, if there was any history here along those lines. For example, the government in my State is contemplating a tremendous undertaking.

Mr. FABRICK. Yes.

Senator KUCHEL. I think $11 billion, including multipurpose dams to be built by the State. I was wondering if there were any similar situation.

Mr. FABRICK. No; the nature of our program is one to construct small generation systems and no more.

Senator KUCHEL. We have the Federal small projects legislation; I think there is a $5 million ceiling on that.

Mr. FABRICK. Yes, sir.

Senator KUCHEL. So to that extent the people of this State have been supplying similar available assistance?

Mr. FABRICK. That is right.

Senator KUCHEL. Thank you, sir.

Senator MURRAY. Mr. A. W. Clarkson, assistant director of the Montana State Board of Health.

## STATEMENT OF A. W. CLARKSON, ASSISTANT DIRECTOR, DIVISION OF ENVIRONMENTAL SANITATION OF THE MONTANA STATE BOARD OF HEALTH FOR DR. G. D. THOMPSON, ACTING EXECUTIVE OFFICER

Mr. CLARKSON. Mr. Chairman, members of the committee, I am A. W. Clarkson, assistant director, Division of Environmental Sanitation of the Montana State Board of Health. I have been asked to represent Dr. Thompson and present for him the statement which he was prepared to give today before the committee.

Dr. Thompson asked me to express his disappointment and regret for being unable to be here. Strangely enough, his change in plans was made necessary because of certain actions of the State board of health at their October 3 meeting pertaining to the correction of stream pollution problems requiring his attention in Helena.

Mr. CLARKSON (reading). Mr. Chairman and members of the committee, I am G. D. Carlyle Thompson, M.D., acting executive officer, Montana State Board of Health. I am speaking for the Montana State Board of Health and the State water pollution council, of which I am a member and the administrator of their program.

The activities of these two bodies are closely integrated and coordinated with the State board of health, having legal responsibility for providing the administration of the water pollution council's functions and for the overview powers whenever public health is a part of any council action.

I appreciate the privilege of presenting to you our views on problems of water resources, which are so necessary to Montana.

The Montana State Board of Health has been actively involved in public water supply, sewage disposal, and the health aspects of stream pollution problems, since the legislature made this agency responsible for them in 1909, just 50 years ago. Then in 1955, the Montana's present water pollution control legislation was passed.

A council, first appointed in July 1955, and consisting of one representative each from municipalities, agriculture, organic industries, and inorganic industries, plus the State engineer, the State director of fish and game department, and the executive officer of the State board of health, involved in all phases of water pollution control.

Since 1955, the Montana State Board of Health has been responsible for administering the program for the water pollution council, using its staff and facilities and providing a secretary for the council.

This probably answers the Senator's question regarding our stream pollution law.

One of Montana's greatest assets is its many streams. Besides being a primary tourist attraction, the streams afford the primary source of water for our Montana municipalities, the source of water for irrigation, industries, recreation, fish and wildlife. Water must be used to satisfy the needs of all; however, the most important use of water is its domestic use.

Without water communities cannot exist and people cannot live.

Of those persons served with municipal water in Montana, 45 percent are totally dependent upon surface supplies, while an additional 30 percent obtain their water from a combination of wells and surface supplies, making a total of 75 percent dependent upon surface water supplies for their drinking and household uses.

The estimated 1958 population of Montana was 688,000. Assuming a reasonable continued growth, by 1980 future problems are analyzed for a population of approximately 1 million.

We derive this 1 million figure, if I may digress from the notes a minute, by the projection of the national census figures based on our Montana birth rates and the expected continued growth of Montana in accordance with the rest of the United States.

About 58 percent of the present State population is served by municipal water systems. If this is increased to 60 percent in 1980, it would mean that the municipal supplies must furnish water to 600,000 persons. Of the municipal supplies, 75 percent, or 450,000, will be dependent upon surface water.

We are at the present time faced with a problem of some cities and towns unable to obtain sufficient underground water for their communities. It can, therefore, be anticipated that more of the communities will be resorting to surface waters.

At the new airbase at Glasgow, Mont., they originally planned a ground water supply to serve the base. It was inadequate. It could not be developed any further, so they had to pipe water 30 miles from the Missouri River to furnish water to take care of the airbase. There are other communities in the State facing these same conditions.

The per capita use of water is increasing throughout the United States. Currently the national estimate indicates that people are using about 160 gallons of water per day per person.

A study of 51 public water supplies in Montana made in 1957 show that over 250 gallons per person per day is currently used in our State.

Mr. Waldo stated in his testimony that the city of Billings was using 165 gallons per person per day. Billings has a metered supply. A number of communities in the State use water on a flat rate without meters and people use as much water as they need without being metered and they will tend to use more water when it is not metered.

In Montana our municipalities are using the largest quantities of water during the summer sprinkling season, when as much as 1,000 gallons per person per day is used. If we use the average of 300 gallons per person per day as a minimum requirement, assuming water

use in Montana increased about 40 gallons per person per day as is predicated nationally—which is an increase in accordance with the national increase—by 1980 we will need about 180 million gallons of water per day to meet the public needs with a maximum peak demand during the summer sprinkling season of over 6 million gallons per day.

The American Water Works Association has estimated that prior to 1955 there was invested about $95 per person served by the water works utilities. Based upon this estimate, the present investment in water utilities in Montana amounts to over $38 million.

The CHAIRMAN. Wait a minute.

In the United States?

Mr. CLARKSON. That is the overall average of $95 per person.

The CHAIRMAN. 1955?

Mr. CLARKSON. That was up to 1955. That is taking all the past works.

The CHAIRMAN. The population was what at that time?

Mr. CLARKSON. Sir?

The CHAIRMAN. The population was what at that time? The population at that time was about 163 million?

Mr. CLARKSON. I think it was.

The CHAIRMAN. How much per person?

Mr. CLARKSON. About $95 per person.

The CHAIRMAN. Yes; $16 billion.

Is that their estimate of the total?

Mr. CLARKSON. I have those figures in another place, but I don't have them in this report.

The CHAIRMAN. Put them in the record.

You are going to make a forecast here?

Mr. CLARKSON. I have them for Montana. I have the figures for Montana. I think the American Water Works has prepared a complete statement as to the needs naturally.

The CHAIRMAN. Yes. All right.

Mr. CLARKSON. The per capita investment is increasing with the increased cost of materials and products. At the present prices, it is costing between two and three hundred dollars per person served to increase the water facilities to meet current needs. Therefore, if water is to be provided for an increase of 200,000 water users by 1980, the expenditure necessary for this purpose alone will require an investment of approximately $50 million. Assuming another $50 million needed for replacing existing systems now inadequate and obsolete and others expected to be inadequate and obsolete by 1980.

These estimates are based on the increased construction cost index of 137 percent between the years 1946 and 1956. Assuming a continued rise of from 10 to 25 percent in the cost index by 1980, a reasonable estimate of $110 million to $125 million will be needed by the Montana water works utilities in order to meet the 1980 population water requirements.

I think you asked the question, Senator, a while back about our underground waters of Montana.

Senator KUCHEL. Yes, sir.

Mr. CLARKSON. The eastern part of the State has decidedly high mineral waters in which the mineral contents far exceed the tolerance

limits for human consumption. And in that case the towns have to resort to other sources of water.

Usually the upper stratas of water are not of sufficient quantities to furnish adequate public water supplies. However, in western Montana in some of the valleys we have well supplies that will produce well over a million gallons a day per well.

Senator KUCHEL. In the east then the Yellowstone becomes an increasing source of municipal water?

Mr. CLARKSON. Yes.

Senator KUCHEL. And the Missouri as well?

Mr. CLARKSON. There are a few towns on the east that do have ground water sources, but they are rather sparsely separated. The majority of the towns on the Yellowstone are dependent on the Yellowstone River for their public water supplies.

In order to conserve our surface water supplies, the pollution of our streams must be kept to a minimum. However, it will also be necessary to do research in order to meet future water needs.

One suggestion has been that our ground water resources might be increased by artificial means. For example: storing floodwaters underground where there would be a negligible evaporation loss. Better handling of ground water resources is also a possibility.

There is now research underway in the removal of salt from ground waters. These saline water studies could mean a great deal to our State, since much of our underground water is unusable for humans because of the large amounts of dissolved salts present in this water. If these salts could be removed economically, we would obtain vast quantities of water that would be suitable for human use.

In order to conserve our surface water supplies, it is necessary that we control pollution. Pollution originates both from humans and from industry. As our population increases, we can anticipate there will be more wastes produced and we need help to insure that these wastes will not be deterious to our streams. This may require additional research to develop better methods for treating wastes.

Several of our industries in Montana have excellent methods for disposing of their wastes. The same can be said for some of our municipalities.

The major industrial pollution in Montana streams is from oil refineries, beet sugar processing plants, packinghouses, smelters, and mines. A craft mill, placed in operation on the Clark Fork River in November 1957, after early difficulties apparently has worked out a suitable method for handling their wastes. It can be anticipated that other mills to produce pulp will be constructed because of our timber and water resources that are so necessary for these operations.

We expect that these industries will also be able to take care of their waste at the time the plants are developed so we will not have an increased load on the streams.

The municipalities have done much to take care of their sewerage in the past few years. Section 6 of Public Law 660, the Federal Water Pollution Act, has with its grants helped greatly to assist the communities in building sewage treatment facilities. Approximately one-half of the people of the State are served by sewers. Thirty-eight percent of those served presently have adequate treatment and another 31 percent are presently constructing or will begin construction in the next 6 months of adequate treatment works.

It is hoped, based upon our present rate of improvement, that within the next 5 to 10 years the municipal pollution problem will have been completely taken care of in Montana, except for new growth and replacement of plants becoming obsolete.

There are currently 13 cities in the State which do not have adequate treatment and which are being—part of this board action which Dr. Thompson is involved in at the present time.

With the development of new industries, it is very difficult to predict the type and scope of wastes that must be disposed of without detriment to our streams. With our existing pollution laws and with continued cooperation of industry, we believe that we can protect our streams for the multipurpose usage as the laws intend. This requires that we have adequate personnel who are properly trained.

At this time the State Water Pollution Council is in the process of classifying Montana streams according to their most beneficial use. Water quality standards have already been adopted by the water pollution council and approved by the State board of health.

Prior to the stream classification, comprehensive stream surveys and studies are necessary in order to determine the chemical, bacteriological, and biological quality of Montana waters. This program is essential and funds provided by section 5 of the Public Law 660 have been of value in assisting with these studies.

Upon the completion of Montana stream classification which is anticipated in 1960, continued stream studies will be required in order to better refine stream data and to evaluate stream changes from material or artificial causes.

Continued review of current stream standards will be necessary in light of new knowledge, better stream data, and changing stream conditions and their effect on water usage.

Montana cooperates and works with its adjoining States and the Provinces in Canada to control stream pollution through councils and representation on a committee of engineers. We think this is highly desirable.

In order to properly develop and utilize our water resources, the following principles are essential:

1. Plan for an adequate supply of water for our people, prevent waste of water, reduce pollution to its lowest practicable level, provide effective storage and distribution of water.

2. Give first priority for water to people for their domestic and other related uses through private and public water supplies.

3. Obtain and utilize basic hydrologic data in developing a public policy on water resources. State and Federal agencies responsible for the compiling of this data must have the necessary financial support.

4. In the consideration of problems which arise and in the development of new statutes, hydrologists and engineers should be consulted along with lawyers and economists.

5. Local communities and their agencies should be encouraged to assume the initiative and responsibility for planning, financing, constructing and operating water works for domestic, industrial, and commercial water supplies.

6. Legislation is needed to encourage the development of water districts other than municipal for the development, production, treat-

ment and distribution of water for domestic, commercial, industrial, municipal, and fire protection uses.

7. A method providing incentive to industry to take care of its wastes should be developed. Cities have received Federal aid toward the construction of treatment plants. The Federal incentive to industries could be in the form of a fast tax writeoff or some other method which would encourage industry to provide proper treatment of its wastes.

Thank you, Mr. Chairman and members of the committee, for this opportunity to present our views. If you have any questions, we will try to answer them.

The CHAIRMAN. Any questions?

Thank you, Mr. Clarkson.

We will recess for 1 hour.

Senator MURRAY. It is satisfactory to me.

The CHAIRMAN. And come back at 1:15, gentlemen.

(Thereupon, at 12:15 p.m., the committee recessed, to reconvene at 1:15 p.m., same day.)

AFTERNOON SESSION

The CHAIRMAN. Dr. J. C. Hide, professor of soils, Montana State College.

All right, Doctor.

## STATEMENT OF DR. J. C. HIDE, PROFESSOR OF SOILS, MONTANA STATE COLLEGE

Mr. HIDE. Members of the committee, I have a prepared report here that could be read but with your permission I would prefer to talk about it rather than read it.

The CHAIRMAN. Put it in the record as it is and then make such remarks as you see fit.

(The prepared statement referred to follows:)

STATEMENT OF MONTANA AGRICULTURAL EXPERIMENT STATION [1]

The need for research on water resources development, control, and use is a paramount and continuing problem. Research needs in the water resources area can be expected to intensify as demand increases for the various primary and secondary products of these resources. The need for basic factual information reaches crises proportions when large new investments are proposed for the development of water resources. Successful research can yield results of value in the design, construction, operation, and maintenance of projects; in improved management of croplands, rangelands, and forest lands comprising the watersheds; and in improvement in understanding of the economic and social interests of the society at large.

The water resource problems needing additional research in Montana can be divided into two major groups. First, are those problems involved in the development, control, and use of water available in surface streams and lakes and in groundwater supplies. Second are those problems involved in the conservation and use of the natural precipitation where it falls with their effect on crop and forage production and on the ability of the watershed to yield a stable runoff. Research needs will be discussed in this statement under these two main groupings.

[1] A statement prepared by staff members of the Montana Agricultural Experiment Station and presented by Dr. J. C. Hide, professor of soils.

I. THE DEVELOPMENT, CONTROL, AND USE OF WATER RESOURCES

*1. Research on the competitive demands for water*

There are growing controversies over alternative uses of water resources and the marketing and pricing methods by which water is allocated among users. Many of the uses of our water are competitive, while others are complementary to each other. Flood control and power development have some complementary features; high dams permit increased power development and at the same time provide flood control facilities. On the other hand, industrial uses tend to be competitive with irrigation uses. Further, some uses are not consumptive in nature (power use) while other uses, such as irrigation, result in the complete disappearance of water.

In the past, the important goals of water use have been irrigation, navigation, and flood control—present marketing and pricing policies reflect these goals. Today the demand for water for other uses is increasing at an accelerated rate. Future projections for water use indicate tremendous growth in the requirements of water for domestic consumption, industrial, power, health, and recreational uses. As a result of these changing needs, public goals and policies applicable to water use are changing.

*2. Research on the procedures for allocating water to different uses*

In the past, water rights were tied primarily to landownership or to a concept of prior use; more recently the public has been concerned with the concept of beneficial use or with some system of priorities of use. The allocative concepts generally have not been oriented to the marginal productivity of water or to price as an allocator as was the case for other natural resources such as land and minerals. The competitive pricing system should be reexamined as a possible distributive device for water.

Serious study needs to be directed at the present methods of marketing and pricing water as related to the growing needs for water in the context of present foreseeable goals of society. Studies of this type are essential also as a basis for the formation of economic and socially desirable water use policy.

*3. Research on reorganization of existing irrigation systems*

Considerations of economic feasibility generally were not made in the development of many existing irrigation projects. Evidence indicates that in practically every stream basin in the West, where the water supplies have been overappropriated and where there is need for supplemental supplies, more efficient use could be made of the water by consolidation of ditches and correction of other physical inefficiencies. The desirability of changes in the present practices has been recognized for many years, but few adjustments have been made due chiefly to man's inherent resistance to any change in the order of things which have been long established.

Much water could be saved each year in the irrigated region of the West by more careful design and operation of storage facilities and delivery. The distributing agency often is too small or is inadequately organized to administer effectively the most desirable delivery scheme. Comprehensive economic analysis showing conclusive evidence of financial feasibility and increased efficiency in the use of water would aid in overcoming the reluctance of farmers to make adjustments.

*4. Research on water rights and water law*

As a closing note one might point out that the general trend in water development is a transition from individual to group action. Water law has developed from an original "no limit on use" to limitations on harmful and export uses and definition of beneficial or reasonable use on a statewide administrative basis rather than court control alone. This involves economic crietria such as protection of property rights in order to encourage the development of water resources to economic optimum, i.e. security; adaptation to changing conditions, i.e. flexibility; exclusion of new use because of prior appropriation, i.e. rigidity; ease of settlement of disputes, i.e. institutional lag.

Optimum development of our water resources necessitates control by a comprehensive well-organized code based upon a critical analysis of the necessary economic criteria evaluated from both the legal and geologic disciplines. Emphasis must be placed not only upon the type of administration, method of acquisition, interrelationship between rights, and interrealtionship between use and users including preference ratings, but also upon the degree of the aforementioned in light of increasing group action.

*5. Research to reduce water losses from canals*

According to the U.S. Census report, approximately 50 percent of the water diverted into irrigation canals and ditches is lost before it reaches the farmers' headgate. Thus, the efficiency of Montana's rivers and streams for irrigation is reduced 50 percent before the producer gets his water. The major source of this loss is seepage. In those areas of high income specialty crops, this loss is reduced or eliminated by the use of concrete or asphalt ditch linings. However, the cost of such linings limits their use under Montana conditions because returns cannot justify such an investment. Increasing demands for water in the future may result in conditions, such as high water cost, that may justify such expenditures but there is a real need for research to develop low cost canal linings to reduce these water losses.

II. THE CONSERVATION AND USE OF NATURAL PRECIPITATION

*1. Research on the control of water evaporation from the soil surface*

The best estimates are that between two-thirds and three-fourths of the precipitation in dryland summer-rainfall-type areas, is lost by evaporation without having much, if any, influence on crop growth. Since runoff in these areas usually accounts for less than 5 percent of the rainfall, it follows that only 20–30 percent of the precipitation in dryland areas of the Great Plains is directly used for crop growth. During the past 10 years research has contributed to our knowledge of the nature of moisture loss during an evaporation cycle and potential methods of reducing it. This data indicates that soil properties have considerable influence on the amount of water lost in an evaporation cycle. A detailed knowledge of the desired properties in soils may make it possible to modify other soils so that less water will be lost by evaporation. Special treatments such as mulches, including rocks, plastic films, and soil treatments have been found to reduce the evaporation loss but have not been developed to where they can be recommended on a field scale. Some of these treatments have increased the amount of moisture stored in fallow during the summer season by four or more times. If efficiency can be increased to the point where the available water supply more than meets crop demands the excess water would contribute to ground water or streamflow and provide extra water for irrigation or alternate uses.

*2. Research on weed control*

For high water-use efficiency, weeds should not be permitted to compete with crop plants for the limited water supply. The introduction of chemical weed-control methods has had a tremendous influence on the control of weeds. Yet it is estimated that farmers and ranchers are now losing between $60 million and $65 million from their potential income because of weeds. Additional research is needed on weed control on dry croplands and rangelands. Such research can result in more efficient use of water in the production of crops and range forage and improve the capacity of the watershed to yield water for other uses. Also, weed control on irrigated lands and in the canals and ditches of irrigation systems is of great economic importance through more efficient use of the available water supply.

*3. Research on range management*

Montana's large range area makes an important contribution to Montana's income from livestock. In the past, range studies have usually taken the ecological and management approach. This approach has and will continue to increase range productivity and, consequently, water-use efficiency.

However, it is known that range productivity per unit of water is very low even under good management. Studies are now being undertaken to determine why the native grasses and range vegetation require so much water to produce a unit of dry matter. Additional studies should aid in increasing range productivity per unit of water. The management of rangelands and the improvement of water utilization on rangelands can do much, also, to improve the place of rangeland watershed in the total water-resources picture.

*4. Research on weather modification*

Because precipitation is highly variable from site to site within a storm, it has been difficult to establish the effectiveness of cloud seeding. It is fairly well established that under some conditions cloud seeding will increase precipitation. To effectively use cloud seeding it is necessary to know the conditions under

which favorable results can be secured. Seeding during the winter to increase snowfall may be at least as valuable as attempting to increase growing-season precipitation. Increasing the snowpack at high elevations should favorably influence the water available for irrigation or alternate uses. There are also indications that cloud seeding can be used to reduce the incidence of hailstorms and a reduction of this loss would increase the return secured from our limited moisture supply. If supplemental funds were available, studies on the effectiveness of such treatments could be undertaken to determine their practicability.

Meteorologists are also giving attention to the possibility of modifying the general circulation of the atmosphere. Such studies would require broad-scale international cooperation. The first step in such a program would be the accumulation of extensive detailed atmospheric data. The Montana Agricultural Experiment Station has not participated in such studies beyond taking usual weather observations but would be prepared to undertake such studies as part of a regional approach to the problem.

The station has already participated in phenological studies, which is attempting to relate weather data to the induction of certain growth phases in plants. Data of this type will aid in better adjusting agricultural practices to climatic conditions. Information of this type should make possible better timing of farm operations and increase yields with a corresponding increase in the efficiency of water use.

### III. SUMMARY

1. There will undoubtedly come a time when the full development of all the national water resources will be made necessary because of the anticipated increase in population. Population pressures are already being felt in some parts of the country. Any development planned or approved for such areas should be made only when all factual data is available and when full consideration has been given for later development in other areas dependent on the same water supply.

In conclusion, the need for research in the field of water resources is great. Research cannot be hurried or pressured, therefore research should be carried on with a long look ahead. Funds appropriated for research should be looked upon as an investment rather than an expense. Such investments will become increasingly important as the pressure of population on the land and water resources of the Nation grows even more severe.

Mr. HIDE. First, I want to express the regrets of Director Hoffman that he cannot be here today. They have an agricultural conference in progress in Bozeman that has been planned for 3 or 4 months and he was involved in that. However, President Reney will appear before the committee on Monday in Missoula. I am sure that Dr. Reney regrets that he cannot be here as well.

In an expanding economy it is inherent that the shortage of some resource will set an upper limit to expansion. A major purpose of research is to attempt to bypass or alleviate these limits on resources. I think agricultural research has a good record, if we go back over 150 years, the first resource that was supposedly going to curtail agricultural production was phosphorus. I think that has been pretty well alleviated. And the second one was nitrogen and that again has been pretty well alleviated. I would not say they are to the point where we can neglect them, by any means. But I think they are out of national-catastrophe proportions.

The third one that has come up is erosion and conservation and again I believe it is to the point where we don't foresee a national catastrophe but certainly continued progress and work is needed.

An example of general research doing a similar thing is the development of atomic power and its looks now as if we have a perpetual supply assured through atomic sources for power.

Now, the current major problem, of course, is this water problem. It is needed by expanding population, industrial use, agricultural use, recreation and domestic water use. Their uses on what appears to be a fixed water supply.

I would mention also that, with regard to phosphorus and nitrogen, again it looked as though there were absolute limits on those and those have been largely whipped at the present time. So it is hard to foresee what we can do in this field. But if we take a defeatist attitude now I am sure we won't do much.

As far as the experiment-station report is concerned, it falls into two phases.

The first one is the development and control and use of water resources in streams, lakes, and underground sources. I believe there will be some additional statements on at least underground sources a little later in the afternoon, and the second one is conservation and use of national precipitation where it falls.

Under the first heading I think there are a number of research fields that need development. I am not going to list all of them, as others are going to bring in other reports. I think there is growing controversy over the need for alternate uses and pricing and methods of allocation of water.

A good example of this pricing situation comes up when we come to the possibilities of paying for water for industrial uses in contrast to irrigation. One may support a higher pricing policy than others. What will come of this, I don't know. I think it is something that has to be developed in the future.

Some of the uses of water are complementary, like flood control and power. We get the two of them together without much fundamental use of water. That is direct use of water. Others are competitive such as use of water for industry and for irrigation. We use it for one; we cannot use it for the other.

Power generally does not use water consumptively. The present pricing of water in this State, and I think over at least some of the States in the West, reflect past goals in irrigation, navigation, and flood control, but the demands are increasing for domestic consumption, industrial development, power, health, and recreational uses.

This recreational use is getting to the point where we have almost as many acres of boats, I think, as we have water.

We need research on procedures for allocating water. In Montana I think the present allocation is based primarily on prior use. And probably we need to give some consideration at least to beneficial use. If we start changing those allocations as I see it, we are going to really have some problems but at the same time I don't believe we can afford to neglect looking into the possibilities, and research along this line seems to be called for. That is, should some form of pricing be used to allocate water where there would be the greatest need. I think we need research in reorganizing irrigation systems. I think it has been pretty well pointed out this morning that we have a large number of small irrigation systems in the State; some of those have been developed one after the other, parallel ditches and so forth, and probably we could get more economic use by combining some of these in spite of the fact that that raises serious problems with regard to just who is going to get the water, how it will be done, and so forth.

We need expanding research on water rights and water law. That is, there is a trend from individual water rights to group action. There is a trend from no limit on water use to limitations on harmful use that is caused by waterlogging of soils, pollution, and so forth. I think we need research along this line.

There will be serious problems associated with changes of this kind.

Another major problem in the State is loss from canals, and I think this applies to a lot of the West although I believe, Senator Kuchel, you are doing pretty well in California with irrigation and so forth.

Senator KUCHEL. Apparently the reason why this resolution includes a study of that sort of potential savings was because of Carl Hayden, or Arizona. And it has excited my interest enough so that I want to compare what the people of Arizona have done with what I know has been done by the people of my State.

Mr. HIDE. There are problems in Montana that don't necessarily come up in your State in that a lot of our irrigation is on comparatively low value crops and consequently the cost of concrete lines and so forth become almost prohibitive.

Senator KUCHEL. I see.

Mr. HIDE. What we can do, I don't know. But I think there are possibilities of developing cheap lining; some of these plastic materials offer promise; tire-type surfaces offer promises; bentonite offers promises. I think we need more research on what can be done on a low-cost return.

Senator KUCHEL. Yes, sir.

Mr. HIDE. I think these are problems that probably have appeared most directly before your committee. There were a number of reports mentioned this morning that have appeared in the last 10 years and I think most of those have ignored what I want to mention next, and that is conservation in use of national precipitation. The most recent of those reports, which I believe is this water facilities research facility needs for soil and water conservation, I think brings this out pretty well. For example, on our dryland areas, as near as we can make out, we are evaporating from the actual soil surface without any use from crops, from three-eights to three-quarters of actual precipitation that falls and it is only about 17 inches in Montana. Actually, runoff makes up a small part of the total loss, probably less than 5 percent for most of the argicultural areas, although it may run as high as 50 percent from some of the mountain areas.

I had occasion, Senator Young, to calculate the runoff from the James Valley above Jamestown, N. Dak., and I think it amounts to a tenth of an inch, tenth of an acre-inch per year, or tenth of an inch over the entire watershed above Jamestown, N. Dak. In other words, if you completely stop the flow in the James River you are not going to get an awful lot of additional water.

This means that 20 to 30 percent of the water that actually falls is usually used by crops under our drylands situation. And I believe this is unusually—or unreasonably—low. It is only within the last 10 years that we really tried to do anything progressive about this, although if we go back 30 or 40 years when Hardy W. Campbell was traveling over the plains preaching the dust mulch fundamentally he was getting at an attempt to conserve water from evaporation. It so happened that the methods that he thought were applicable at that

time were not applicable. At the same time, with some attempt to discredit him, and so forth, because he was doing the wrong thing, that is, the dust mulch cured wind erosion, we are inclined to swing over to the other extreme and neglect the evaporation. I think there are really problems there. We find, for example, soils differ from the soil that is irrigated and the soil under fallow.

In the past year we had data indicating one soil allowed 50 percent more water stored at depths greater than 4 inches. If we can follow this out and find out some of these soils store water more efficiently than other soils and then develop methods of increasing the efficiency on the soils that are poor, I think we might have a potential water supply maybe even almost equal to our streamflow at the present time. But it would be spread over the entire State.

We have some treatments. It is possible, for example, to use treatments that will increase the efficiency of water. Plastic covers, rock mulches, and various things have been used. We don't think they are practical yet. But we believe they are trends in the right direction and consequently have possibilities for future development in spite of the fact that we cannot make recommendations at the present time.

But studies of this kind, of course, have more implications in connection with longtime development of water resources.

Another one I want to mention is weeds. Any time we use water to grow weeds, the water is wasted. We are losing water efficiency. Chemical control of weeds had a tremendous implication or tremendous reduction in the amount of weeds that we have over a lot of our areas. At the same time it is estimated that in Montana we are still losing $60 million a year through weed growth. That is actually lost in yields. The loss in shipping and various factors of that kind is costing us something like $60 million.

Complete control of weeds would improve crop growth, it would improve range land and possibly increase the water reserves that could be secured from something like 57 million acres of range lands in Montana.

And then when we come to irrigation we have real problems with weeds, particularly in ditch banks, slowing down water flow in the ditches, probably increasing seepage loss from the ditches and then on the fields themselves.

The third one I want to mention is studies on range. We have had a good deal of range research work but most of the range research work in the past has developed along the lines of management and the ecological approach to more efficient use of range lands. We do know that the return we get per unit of water from range land is extremely low. Like, for example, on dry land it is not too hard to produce 10 bushels of wheat on the average on some of these lands and probably 1,200 pounds of straw, or roughly 1,800 pounds of dry matter yield that is binder cutting, whereas it is difficult to get more than 300 pounds of production under range conditions. In other words, the crop land is making about six times as efficient use of water as the range lands. These range lands are not suited to crop production in general. What we are trying to do now is get at the reasons for range plants being so low in efficiency and trying to correct them to the point where we can get a great deal more return from our ranges.

Another one I want to mention is weather modification. We have heard a good deal in the last 10 years particularly about cloud seeding, for example. It has come into disrepute to some extent. The high variability of the rainfall within a storm makes it extremely difficult to measure actually whether cloud seeding has accomplished anything or not. However, the best information at the present time, I believe, indicates that cloud seeding has contributed to rainfall in certain instances. If we are going to use cloud seeding we need to know more about under what conditions we can get effective results and use cloud seeding to maximum efficiency. It is possible or probable that cloud seeding for snow cover may be every bit as important as cloud seeding during the summer season for actual seasonal rainfall. I don't believe it is in the report but I think probably it might be well to mention something on snow management in these northern areas. Indications are that we are not getting too good use of the moisture that comes as snow and we don't know anything about the possibilities. I think there has been just a little bit of work done in North Dakota and a little bit in Montana. There are some reports 10 or 12 years ago by SCS. Those are the areas we have the greatest possibilities of plain snow. Then we have possibilities of increasing the pack at high elevations and consequently increasing our flow during the irrigation season.

I think there are good indications that hail—there may be possibilities of reducing the instance of hail by cloud seeding. If we reduce hail, of course we fundamentally increase efficiency because we reduce the loss from hail damage.

The Montana station has not undertaken work along this line, but I think the first step in such work is increased detailed knowledge of the atmosphere and the possibilities of getting additional water from it and we would be prepared to participate in such work.

The next one I want to mention is that the climatologists and meteorologists are even giving consideration to the possibilities of control of air circulation. We hear of that in connection with competition between Russia and the United States and other countries.

If we get into something like this there are tremendous international complications in using such methods. At the same time I think we want to investigate these possibilities when we get into experiments of that kind; they are tremendous things and probably should be handled by the Weather Bureau or some other organization. Again, detailed atmospheric knowledge is necessary and again the State college would be preparing to participate if such is necessary. We have been for the past 4 or 5 years in phenological studies. That is, studies that are attempting to determine what conditions induce a certain stage of growth in plants. One of them is determining where and when lilacs come into bloom because it is an easy one to get records on. We believe that this type of information will make for more timeliness in agricultural operations. If it will make for more timeliness, then probably it will increase yields for a given amount of water and consequently contribute to moisture efficiency.

I think those are the major points I wanted to mention. However, just in summary, I think we are coming to the time when all the water resources will be used one way or another. I think it is essential that we have a maximum of information so that in planning for this

use it is developed to maximum efficiency. We must control all losses wherever possible and avoid wasteful use of water. The need is great but the information cannot be obtained in a hurry. Probably the need will be a great deal greater 20 years from now than it is now. But the need for research is now so we can make satisfactory planning for these problems as they arise with increasing population and increasing use demand for water use.

I would just like to mention something with regard to organization of research facilities, research as we make additional progress fundamentally becomes more expensive. I think we want to have our research centered at large organizations where we can have the most efficient equipment available that can be obtained. If we put a small facility out some place, a library becomes critical. It isn't too hard to put half a million dollars into a library. You never know where the paper you want is going to be. That is, it might be in some obscure journal or one that you would have generally available. Even in agricultural research often you want to go to a physical chemistry journal, phenological journals, and so forth.

Senator YOUNG. I think you are touching on an important point because there is a tendency now on the part of Congress to establish little research centers all over the United States, sometimes three or four in one State.

Mr. HIDE. Yes. In case I am misunderstood here, I don't want to draw the conclusion it should all be in one location; we don't need these field locations spreads out. We need these, definitely, but I think they need to be tied in with the large facility so what can be done more efficiently in the central facility will be done there and the field aspect of the work will be done at the location where the problem is.

Another one that I would like to mention that we hear a lot about at the present time is research makes for surplus. I think research makes surpluses possible. But at the same time I don't believe we should blame research for the surpluses. It is another problem that causes the surpluses. We have got to balance these things out someway or another. Certainly the Congress and the Senate are giving a lot of attention to agricultural programs. I think we will get it balanced out someway or other. What the direction will be, I don't know. I hope that I am never asked to solve the problem. I know a lot of people have given attention to it.

Senator YOUNG. That is one that I run head into as a member of the Subcommittee on Agricultural Appropriations. We have them say, "Why spend more money on production research when we have a surplus?" But I think you have to continue research to attain more economical production to meet competition from other countries and to stay in business. As you know, we would be out of the production of flax if we had not developed the newer varieties, wheat varieties continue to become susceptible to diseases so you can't grow them. You have to have these higher yields in order to make farming pay.

Mr. HIDE. I believe we largely have taken over a big market you had for barley just because of one disease.

Senator YOUNG. Yes. I think one field we are not spending half enough money in is utilization of research.

Mr. HIDE. Yes. As I see it, research is contributing to efficiency of production. The actual amount of production is a different problem.

Senator YOUNG. If we spend as much money for utilization research of farm surpluses as these oil industries to find new uses for their product, I don't think we would have any surplus.

Mr. HIDE. Then this efficiency thing comes in again. That is, if we can produce a bushel of wheat more efficiently, we put it in a better competitive position as far as alternate uses are concerned, and then I believe that is all I have to say, unless you have additional questions.

The CHAIRMAN. Thank you very much, Dr. Hide. We are happy to have had you.

Mrs. E. J. Eichwald.

Mr. STONG. I don't think she is here, Senator.

The CHAIRMAN. Colin W. Raff, vice president, Montana Power Co.

## STATEMENT OF COLIN W. RAFF, VICE PRESIDENT, MONTANA POWER CO.

Mr. RAFF. Thank you, Mr. Chairman. Members of the Senate Select Committee on National Water Resources, my name is Colin W. Raff, and I am a vice president of the Montana Power Co., with headquarters in Butte.

As Senator Murray knows so well, water is one of Montana's greatest resources, and its wise conservation and use are enormously important to the continued growth and development of this State. One of the most important uses of water in Montana, of course, is irrigation. The dominant position of our agricultural economy, which accounts for approximately one-half of the State's annual value of production, makes sound irrigation vitally necessary to our continued growth.

In that regard I would just like to say that great tribute is due to the Montana Water Conservation Board, which for years carried out an irrigation program that is considered a model for Western States. You heard about that this morning from Mr. Fabrick.

We in Montana Power Co. have a real interest in the problem the committee is studying because we are essentially a hydroelectric company and for years have been participating in the development of Montana's water resources.

The Montana Power Co. and its predecessors have been active in the conservation and development of the water resources of this State for nearly 70 years. The Black Eagle hydroelectric development at Great Falls, which is being operated at the present time, was originally built in 1890 as Montana's first important waterpower development and was redeveloped in 1927. The original Canyon Ferry plant on the Missouri River and the Big Hole plant south of Butte were other pioneer hydroelectric developments operated by the predecessors of our company before the turn of the century.

In 1913 we built Hebgen Dam on the Madison River to store and regulate water for irrigation and power purposes. This is the dam, incidentally, that recently came through Montana's severe earthquake with only minor damage. Its ability to withstand the violent shock probably averted a serious flood in the Madison River Valley.

In 1913, the Montana Power Co. developed the Prickly Pear irrigation project in the Helena Valley and operated it successfully for many years before turning it over to the water users of the valley. This project and Hebgen Reservoir are only two of the many examples of our company's great interest in a sound irrigation program for the State of Montana.

At the present time, the Montana Power Co. owns and operates 13 hydroelectric plants in the Missouri, Yellowstone, and Columbia River drainages. Our most recent hydroelectric plant, the Cochrane development near Great Falls, was completed only last year.

Associated with these hydroelectric developments are reservoirs at Flathead, Mystic, Georgetown, and Hebgen Lakes and at our Holter and Hauser plants. These reservoirs have become popular recreation centers for fishing, boating, and water sports, and each year attract thousands of visitors.

Our interest in water also stems from the fact that we provide municipal water service in the city of Missoula and the town of Superior.

From the foregoing, you will see that the Montana Power Co. has a vital interest in sound water development and in the problems associated with our water resources.

One of the important uses of water is in the generation of electric power, and I thought the committee would be interested in the general power situation in Montana.

The Montana Power Co.'s system capability totals 671,000 kilowatts, including 530,000 kilowatts of hydroelectric power, 66,000 kilowatts of steam-electric capacity, and 75,000 kilowatts of purchased power.

Our 671,000-kilowatt capability compares with an alltime peak demand on the Montana Power system of 539,000 kilowatts. From this you will see that Montana is in a surplus position and that it has adequate power for present customers and for future growth.

Because this committee will want to consider power development in its appraisal of water problems, I feel it is especially important for you to be informed about the Montana Power Co.'s program of future power development. This program will be carried out on the principle that we will at all times be in a position to meet the growing requirements of Montana for electric power for home, for agriculture, and for industry.

We recently negotiated a 30-year lease with the Northern Pacific Railway under which we will be able to strip-mine 3,300 acres of coal lands at Colstrip, southeast of Billings. Reserves total between 50 and 60 million tons of sub-bituminous coal. We have acquired three large electrically driven stripping and loading shovels and accessory equipment necessary to mine the coal.

The CHAIRMAN. What do you mean by sub-bituminous coal?

Mr. RAFF. It is about 8,500 or 9,000 B.t.u.'s per ton.

The CHAIRMAN. Per what?

Mr. RAFF. Pardon?

The CHAIRMAN. Per what?

Mr. RAFF. Per ton. It is below the grade of bituminous, of course, but above the grade of lignite.

This coal will give us an extremely low-cost fuel supply for future steam-electric generating stations which can be built on our system.

At the same time, we are in a position to add generating units at several of our existing hydroelectric plants at very low cost to provide us with the peaking powers necessary to go with the energy we can produce at the steam-electric stations.

As a result, we look forward to a future period in Montana when we will be operating large steam-electric generating stations at high load factor to meet the base loads on our system, and we will be using our hydroelectric plants for peaking purposes, as well as for energy.

The economic advantages of this power development program to our customers and to the State of Montana generally are important.

The availability of Colstrip coal gives us an abundant supply of extremely low cost fuel for our steam plants. In addition, we expect to be able to construct steam-electric generating stations in the range of 100,000 kilowatts for approximately $160 per kilowatt, compared with $340 to $2,800 per kilowatt, which is the estimated cost of proposed Federal hydroelectric plants in this area. By the area, I should say the State of Montana, which includes the Columbia drainage as well as the Missouri. In other words, we expect steam-electric construction costs to be considerably below the cost of developing hydro power.

It is our view that, with the program I have outlined here, the Montana Power Co. will have, for many years in the future, one of the lowest cost sources of electric power in the United States.

There are conflicting views about the time when nuclear power will become economically competitive in areas such as Montana, but certainly the coal resources we have will provide us with low-cost power until atomic energy developments make that source of power competitive. At the present time we are participating in high temperature gas-coal reactors to be built in Pennsylvania to demonstrate the long forward step in development of nuclear power science.

The program to be followed by the Montana Power Co. makes it unnecessary for the Federal Government to invest large sums of money in hydroelectric developments in Montana.

We will have an abundant supply of power for the people of this State and we at all times will be in a posiiton to meet the demands created by growth and development of Montana's economy.

In addition, we feel that a program of private development is important to Montana and its people because of the tax revenues that will be derived from it. This is a particularly significant point so far as Montana is concerned because the State urgently needs additional tax revenues to keep pace with its growth.

The CHAIRMAN. At this point, would you tell me what the wholesale rate of your power to the REA cooperatives here is?

Mr. RAFF. Yes; it is the same rate. It is identical with the Bureau of Reclamation rate in the Missouri Basin.

The CHAIRMAN. Which is what?

Mr. RAFF. About 5½ mills at a 50-percent load factor. Our avererage revenue from our REA customers in 1958 was 4.9 mills per kilowatt-hour.

The CHAIRMAN. What is the rate paid by industry in your area for power?

Mr. RAFF. That varies, Senator, depending on the size of the contract, the size of the customer, and whether they are on a special con-

tract. Our large customers are on special contracts; our smaller customers are on what we call our general-service rate.

The CHAIRMAN. I understand.

Mr. RAFF. Generally it will run between 4 and 8 mills, I believe, depending on the size of the customer.

The CHAIRMAN. All right.

Mr. RAFF. The new plants constructed by the Montana Power Co. will add as much as $200,000 in additional property taxes for each plant that is built. The importance of this is emphasized when you consider that—

(1) Federal power developments pay no taxes so that revenue is lost to Federal, State, and local governments;

(2) Additional taxes must be collected from the people to finance Federal power development; and

(3) Every time a Federal plant is constructed in an area, it retards the construction of a powerplant by private enterprise so that, in effect, these Federal plants tend to reduce the taxpaying property that might otherwise be on the tax rolls.

It is our position that development by private enterprise of the power that is needed in Montana will play an important role in combating the inflationary trend that is brought on by unnecessary Government spending.

I would like to make one other point, which is related to the program of handling Montana's water. It is the position of the Montana Power Co. that the preference clauses in Federal power-marketing laws discriminate unfairly against the peoplpe of Montana and especially against the 500,000 Montanans who rely on us for service.

As the preference clause is applied in the Missouri River Basin, power generated in Montana is exported great distances to preference customers in North and South Dakota and other States downstream. Thus, the people of Montana, whose State has provided the water for this power and the land on which the water is stored, are deprived of an opportunity to share in the power that is produced in Montana.

At the present time, we are purchasing from the Bureau of Reclamation 25,000 kilowatts of firm power for use in northern Montana.

Senator YOUNG. I may say our people have the same gripe. We think we are supplying the water and generating the power.

Mr. RAFF. I understand that, Senator, and I don't mean to imply that we don't think North Dakota shouldn't get some of the power, but we think just as I think you do in our State that your power that is developed in your State ought to be put to use in that area first.

We have been told by the Bureau that we cannot purchase this firm power beyond 1962 because, at that time, all of the power from Montana will be needed for preference customers to the east of us.

We feel that this situation discriminates unfairly against our direct customers in northern Montana, against the REA cooperatives which we supply with wholesale power, and against the Glasgow Air Force Base which we serve and which is highly important from the standpoint of national defense.

The CHAIRMAN. If I may interrupt you there, I must say that I have a little trouble harmonizing that with other statements that you have made here because it would seem to me that if you can build

generating stations at a cost of $160 per kilowatt and that the cost to the Bureau is $340 to $2,800 per kilowatt, that anybody who would have the opportunity of being served by you directly rather than by the Bureau through you would be in a preferred position instead of being discriminated against.

Mr. RAFF. I should say, Senator, that the cost per kilowatt of the Federal plants that I mentioned are those that are proposed for the future.

The CHAIRMAN. Then I did not understand that from the statement.

Mr. RAFF. I should have made that clear. That is for future proposed plants that have been investigated for future construction.

The CHAIRMAN. In other words, then, the statement does not include the information as to the cost of the hydroelectric generating facilities now in operation by the Bureau?

Mr. RAFF. I would have to check that, Senator, to see whether they——

The CHAIRMAN. I said the statement you made does not.

Mr. RAFF. It was intended to apply to future plants; yes, sir.

The CHAIRMAN. Then my statement is correct, then, that, so far as your statement, it has not given us that information?

Mr. RAFF. As to what the present plants cost, that is correct. I have not given that information.

The CHAIRMAN. All right.

Mr. RAFF. We understand that power allocations in the Missouri River Basin have resulted in the Montana REA Cooperatives being told they may not receive their full requirements from the Government beyond 1963.

If power from Fort Peck and Canyon Ferry projects could be reserved for use in Montana and if that power were coordinated with the power on our system, we believe it would remove the threat that exists by reason of there not being enough power ultimately to take care of the REA's growth.

The CHAIRMAN. I was under the impression that there was in one authorization—and if the Bureau man is still here he can verify this or correct my impression—that a certain amount of power generated from that project would be reserved to the power users of Montana.

Mr. RAFF. I think I can explain that, Senator. That geographical allocation is contained in the authorization and is followed out by Bonneville Power Administration in the sale of power from Hungry Horse Dam which is in the western part of the State, in the Columbia River Basin.

The CHAIRMAN. None of that power comes to eastern Montana?

Mr. RAFF. No, sir; except that power which we purchase, some of that power on a firm basis and its gets into our system.

The CHAIRMAN. What part of the power from Hungry Horse is by law reserved for Montana?

Mr. RAFF. By law I would say, to answer your question, that a reasonable amount of it is. By actual practice I believe all of the outside power is reserved for use in Montana.

The CHAIRMAN. On Hungry Horse?

Mr. RAFF. Yes. It is sold—pardon me.

The CHAIRMAN. How many projects do you now have that have been built by the Bureau—is Hungry Horse in operation?

Mr. RAFF. Yes, sir.

The CHAIRMAN. That is now in operation and that has that provision with reference to the State in which the project is located?

Mr. RAFF. Of my own knowledge I know of none but Hungry Horse.

The CHAIRMAN. I see. Go ahead.

Senator YOUNG. Mr. Chairman, I think a large part of the power generated at Fort Peck is marketed—at least a considerable part of it in North Dakota—and we lose our power at the weather station. It is interesting to have the figures in the record, as to what part of the power gnerated at Fort Peck is distributed within Montana. Do you have those figures? The Bureau people are here and they probably do.

Mr. RAFF. The Bureau people would probably have a much better figure on that than I.

The CHAIRMAN. Why doesn't the Bureau put a statement in the record listing the power generated in Montana and the consumptive areas that use it? Is the Bureau man here?

Mr. FABRICK. Frank has not returned from lunch yet, Senator. He will be back in a little while.

The CHAIRMAN. We will ask him to put that information in the record, Senator.

Senator YOUNG. Yes.

Mr. RAFF. As I have outlined for you, we will build additional generation to take care of the total load of our company. The use of that energy, with Federal power being used for peaking purposes, would take care of the requirements of the Montana REA cooperatives and would give them the lowest possible rate.

We believe it is well worth discussing this program to see if some plan cannot be worked out so that Montana's requirements will be completely met.

All of us in Montana expect the State to continue to grow and develop, so that we anticipate our water resources will become increasingly important for industrial, agricultural, and domestic purposes. The future of Montana places heavy dependence on water for consumptive purposes such as municipal, industrial, and irrigation uses.

We believe the power-development program which is being carried out by the Montana Power Co. should receive serious consideration in any study of water resources because—

(1) It will assure Montana of an ample supply of power for its future development; and

(2) It will make possible the planning and carrying out of a long-range water program that will assure adequate supplies for the consumptive uses that are so important to the State.

That concludes my statement. I want to express to the chairman and the committee my appreciation for your courtesy in making time available to me and for receiving this statement for the record.

Thank you very much.

The CHAIRMAN. Thank you, Mr. Raff, for a very comprehensive and enlightening statement.

The CHAIRMAN. Mr. Charles Mahoney, president of the Upper Missouri Transmission Cooperative and president of the Midwest Consumers Association.

## STATEMENT OF CHARLES MAHONEY, PRESIDENT OF THE UPPER MISSOURI TRANSMISSION COOPERATIVE AND PRESIDENT OF THE MIDWEST CONSUMERS ASSOCIATION

The CHAIRMAN. You are a State senator?

Mr. MAHONEY. Yes, sir; I have to plead guilty.

The CHAIRMAN. Senator, we do not regard it as a fact that should be so treated, not one that should be viewed as a basis of a plea of guilty, but one that could be used as a basis for a proud declamation. We welcome you, Senator, to this hearing.

Mr. MAHONEY. Senator Kerr, Senator Kuchel, and Senator Young.

I might have to say I have to plead I have been a member of our Senate now 20 years.

Senator YOUNG. That is a good record.

Mr. MAHONEY. I have been there quite a while and I have had a good many battles on it and I have lost a lot of them.

I want to thank you members of this committee for coming out here to take the time to go into these water resources. I feel that this is the most important thing coming before America today. By the year 2000 we are going to be in a critical condition in water. What I don't want is crash programs. I want, like you are starting now, to solve the problems so we don't have to run in, like we did in the past, to all of a sudden plug a hole in the dike and then it costs too much money.

If we can get orderly, constructive thinking and programing in the years that are going to be necessary we have time yet to solve the Nation's water problems.

It is not alone in the Missouri Basin. It is not alone on the Columbia Basin. It is all over the whole United States.

That is one point we have. And I want to thank the U.S. Senate for doing this and taking your members' time. I know this. I listened to the distinguished Senator from Oklahoma the other day. I happened to be in Washington and he was on the floor, and the distinguished Senator Carroll, from Colorado, was trying to postpone something until next spring and the Senator said he hated to have that man worrying and spending all his time from now to next spring trying to find out what his people wanted back home. I enjoyed that little statement the Senator made on the floor.

Here is what we find in there. I happen to belong to the Upper Missouri G. & T., which is an organization composed of eight States, composed of the States of Montana, Wyoming, North Dakota, South Dakota, Nebraska, Iowa, and Minnesota, which are the preference customers under the Missouri Basin marketing power, marketing criteria. There are some things that we have been arguing with. I have been in Washington twice this year on our problems. I am going to present them partly to you and give you some other ideas that I feel are of very urgent need to our people.

Now, I will have, if you will let me change to the map, I would like to show this committee a few things, if at all possible.

The Montana Power man, Mr. Raff, made an absolute, honest statement. There is plenty of power in this part of Montana. But in this part now I am drawing right through with the bus bar at Fort Peck Dam; I am drawing right down through here to this area, Hardin

unit; this area is power deficient today as far as rural electric cooperatives are concerned. Our Upper Missouri G. & T., which is headquartered at Sidney, is going to purchase power from Nebraska Public Power from Nebraska, starting in November of 1959.

Here is the problem that has been the problem that has developed. We are now asked to go in to purchase supplemental power from Nebraska for the winter, from the supplemental power in Wyoming, which is summer firmed from the Bureau in the summertime to cover our contracts. Our power loading has increased and is increasing in my own cooperative, which is McDonald Lake at Circle, which is located right here. We went up 18 percent in this very year.

The CHAIRMAN. Consumption?

Mr. MAHONEY. Consumption has increased.

Now, I happen to live right here, gentlemen. This is my home. This is the county which I represent. It is just about like this. This happens to be mine. I have an awful time explaining to my people at home that I am going clear down here to Nebraska to buy power up here to put in up here and pay 11 mills for it when my people have furnished the dam. My county has this side of it. My county, right around here, and we furnish all this part of the dam to lay the water on. With this 11-mill power it is going to give us an increase in our power cost of approximately 8 percent over all. Buying this little block of 11 versus our 5½ mills will increase our power cost to just about 6 mills or 8 percent.

We can do that. But the only thing we are wondering about is: This is winter power. When we bring navigation in down this——

The CHAIRMAN. Senator——

Mr. MAHONEY. Yes, sir.

The CHAIRMAN. Did you hear the statement of Mr. Raff that they had a surplus of the difference between 671,000 capability and an alltime peak of 439,000 kilowatts and that their rate to the REA was around 5½ mills?

Mr. MAHONEY. All of that is correct, Senator. But this little bus bar cannot be connected. At Fort Peck Dam there is a 15,000-kilowatt generator on this side of the bus bar on the left; on this side of the bus bar there is a 70,000 kilowatt generator, but we cannot connect the two generators.

Senator KUCHEL. Why not?

Mr. MAHONEY. They will not connect. That is the Bureau's answer.

The CHAIRMAN. That is the Bureau's power. I was talking about the power of the Montana Power.

Mr. MAHONEY. Yes. Senator Kerr, we can't get it around the bus bar.

This is now in the MDU system, the Montana-Dakota Utilities system. It does not connect any place.

The CHAIRMAN. Do they have a line from the bus bar to Billings?

Mr. MAHONEY. No; the line from Billings comes in through here, Senator. They come here to Roundup with the line. They feed Fergus Electric off the line here at Roundup. This is where the end of their line comes. All east of this is on the MDU system and the Bureau cannot connect nor the Montana Power cannot connect to get around over here.

The CHAIRMAN. You mean they won't or they physically cannot?

Mr. MAHONEY. Physically, they can't, they say. I don't know. I am not an electrician. You ought to know, Senator, all I am is a little dryland farmer with a few cows.

The CHAIRMAN. I am just a little cowhand with a few farms. Go ahead.

Mr. MAHONEY. This is what happened. This is causing the deficit in this particular area. It is not Montana Power's fault, because the transmission system—we have a second powerhouse at Fort Peck now being constructed—is under construction. When they did that, you in Congress decided you would build a 230 transmission line into the Bismarck area to tie all of the Fort Peck Dam, Garrison Dam, Randall, Aowa, and all of those into a 230 line. Although I was opposed to this, I don't blame you for your decision. There are 115 systems running out here, 2 lines rounding out here, and 1 coming down here. These people down in here are fed off this as far as Bureau customers. MDU wheels for them after you finish the MDU line.

Or finish the Bureau line. The Bureau has a line running to Miles City, from here to Glendive and that. The 230 line is going to take all of the power of the second powerhouse out of the State of Montana.

Now, I am not objecting to that, Senator. But for this point—Montana has requested in 1963, allocation of which the Bureau of Reclamation is now making and has granted Montana about 22,000 kilowatts out of the 70,000 of the first powerhouse on the east bus.

That is going to cause all of these cooperatives here to be short in 1962 when the new powerhouse is supposed to go into effect. I think that it well and due that in this Fort Peck area, an area around here, that we should become preference customers within the environs of a certain area of Fort Peck. This upper Missouri represents different cooperatives in northwestern North Dakota and this area down through here and down to here, which is all the east bus system.

I feel that this committee should look into the problem of reserving to Montana some of this power if we can't get it across. Now, you have a dam here, Canyon Ferry, 50,000 kilowatts.

Mr. Raff of the Montana Power just told you they have 25,000 of that under contract as firm. Where the other 25,000 goes, it must be dumped. But the line cannot go east of here on account——

The CHAIRMAN. Is that other 25,000 going to the Montana Power Co.?

Mr. MAHONEY. I don't know just where it goes. But they are the ones that have——

The CHAIRMAN. Mr. Raff is here, isn't he? Do you take the other 25,000?

Mr. RAFF. I can answer you by saying our 25,000 kilowatts of firm power to the best of our knowledge comes partly from Canyon Ferry, partly from Fort Peck. We don't know which, in what proportion it comes.

The CHAIRMAN. What amount of dump power do you get?

Mr. RAFF. We also buy surplus power from Canyon Ferry.

The CHAIRMAN. Can you tell us about how much that is?

Mr. RAFF. Not in kilowatts, sir, I can't; no.

The CHAIRMAN. With reference to the capacity of the plant.

Mr. RAFF. Well, we buy it when they generate it, and we can provide a market for it. If we cannot, we don't buy it and may hold back. It does not run on a schedule or anything.

The CHAIRMAN. What is the difference in what you are paying for the dump from the——

Mr. RAFF. We pay about 5 mills for firm power and 2½ mills for the dump power.

The CHAIRMAN. All right, Senator.

Mr. MAHONEY. In other words, gentlemen, of federally owned hydroelectric power in the Missouri system there is a total of 65; 50 here and 15 here on the west bus bar.

Now, the REA cooperatives that are served from this area is this one here at Glasgow. There is part of Old Pine served there. There is all of Miles, which is here at Havre and you have an area here at Shelby and at Cut Bank. The rest of this area is served directly from the Montana Power Co.

I have no fights with the power company. I am just trying to show you people how this bus bar is reacting to our troubles in the eastern part of Montana, which Montana Power has nothing to do with. You could approximately draw a line down here and around here and this is MDU's territory.

The CHAIRMAN. MDU?

Mr. MAHONEY. That is Montana-Dakota Utilities Co.

The CHAIRMAN. Yes.

Mr. MAHONEY. We in the upper stream States are willing to be fair and willing to share. I stood at a hearing last year at the river control committee in Omaha when I heard a member of the chamber of commerce of the city of Sioux City say dump all of these dams upstream in the summertime to give us navigation. Now, I heard Mr. Clinton, I believe, this morning said, or it was the Army Engineer man said that every bit of this power went through the powerhouse last month. I get a river control committee report the same as he does. It was. Gentlemen, we have too much power in the summertime because we don't have the load, and not enough power in the wintertime.

The CHAIRMAN. When you do?

Mr. MAHONEY. When we do have the load. We are at peak in the wintertime. Nebraska happens to peak in the summertime.

The CHAIRMAN. I remember a boy of mine when he was a very young lad engaged in an argument with me about when he should go to bed and when he should get up. He wound up his argument by telling me that I forced him to go to bed when he wasn't sleepy and compelled him to get up in the morning when he was.

I don't know why, but your statement reminded me of that conversation.

Mr. MAHONEY. Senators, here is what the deal is. You only navigate in the summertime. You don't navigate in the wintertime. So their theory is to get more water downstream, to get the original high, at one time it was the 6-foot channel up as far as Sioux City; 9 from Omaha. Now, it has become a 9-foot channel from Sioux City. Originally they talked 6 months navigation, now we are talking 10 months navigation. This Missouri system is only going to produce so much water. We hear our geologists say these are low runoff years. Every time we start talking about it, it is low runoff.

This Fort Peck Dam at one time was practically full. It would get up to 18 million acre-feet. Today it has just a little less than 11 million acre-feet. It has been coming up every year for the last 3 years.

All I know is what I read, like Will Rogers said—said in the papers—I will say in the Saturday Evening Post, an article where they dumped this dam to clear down here to New Orleans to save New Orleans' water supply from the salt water coming in their mains. I think it is well for this committee to check that. I have been told by the Army Engineers there was nothing to it. But this gentleman in the Saturday Evening Post of about 3 or 4 years ago said that was done.

Now, we up here in the upstream States then have had our problems of power ever since this reservoir was drawn down. They can't make the maximum power now. But I will tell you that Mr. Johnny Walker, head of the power division for region 6 told us 2 years ago that we were in trouble and they could only make 35,000 kilowatts of power, and that the dam was that low when they had capacity for 70,000.

We are willing to share in necessary things, but I believe, think, and maybe I am wrong, that the first thing is consumptive use of this river for people for their own personal needs. You know there is an awful lot of difference in the amount of water we are using, since we changed over and put inside plumbing in. It is a lot easier to pull the chain.

After personal use should come irrigation, which is a consumptive use of water.

Now we come to the point of paying the bill. Power. Then navigation and recreation.

Now, we were told, and I think Mr. Clinton said it this morning, that they are charging more and more of reclamation to power. They have restudied the basin accounts, and have taken off from these other allocations and reduced those and increased the cost to power. We are willing to pay it. But I don't like to see the dams used and the water dumped for navigation downstream, which when asked at Omaha if they paid anything for navigation their answer was no.

Now, they said they went back to prior, to the time of the Constitution when they wrote in the original Bill of Rights or something, it was a Bill of Rights, it was the Articles of Confederation, that no man could put a cable across the river to stop a navigable stream. Now, I am willing to go along and say that we won't charge you for navigation if we don't put any money in the pot. But the amount of money that you are spending downstream today just for dredging, widening, cleaning that Missouri River Channel, I have seen the figures but I can't quote them right now. They could be received.

Now, I heard Senator Young this morning talk about the freight rates and, Senator, at the very time they were cutting them in Omaha they were raising them here and our Redwood and Public Service Commission in Washington was trying to get it stopped. Let's let them pay a fair share on cost, not a prohibitive cost but a fair cost of this and other cost of this river to get part of the use of the water the same as we are paying for electricity, if they are going to get a cheaper freight rate down here. I want to tell you this. It is laugh-

able. This thing is well organized. I don't blame them. I would do the same thing. In Omaha a year ago last summer at the river control committee on the very front page of the Omaha World Herald they are telling about one boatload of alfalfa pellets that was being shipped down into Alabama. And come to find out that was the first boatload and it was going in about 2 months. I feel that that means we are going to have to go to slack-water navigation, because Montana and Wyoming, which you heard the figures this morning, 17 million acre-feet going through this point right here, that there is where the water originates that we then have something in return for our water. If we are going to have higher freight rates by giving them water downstream, that is going. So in order to conserve water to us to take care of the Dakotas, take care of Wyoming down here, I feel we must go to slack water navigation. As I understand it, reading, quoting again from the Saturday Evening Post, in this summer on their talk to Ohio, that straight slack water, they built it up and you did a marvelous job on the Ohio. The Missouri River cannot afford and cannot furnish the water necessary for free-flowing navigation system south of Sioux City. We are going to have to go to slack-water navigation, I think, in my mind, before long. I am talking in the future but I think this will come long before the year 2000.

Senator YOUNG. This whole business of navigation from Kansas City to Sioux City has been a tremendously expensive thing.

Mr. MAHONEY. Yes.

Senator YOUNG. In terms of subsidy, with the amount of benefits, I doubt if we have another subsidy in the United States that is as high as that.

Mr. MAHONEY. I don't object to them if it doesn't cause me to lose my water up here.

The CHAIRMAN. You sound to me like some Oklahomans, Senator, who take the position that they are against any combine that "they hain't in on."

Mr. MAHONEY. Senator, I want to say this, if you are dealing off my property I would like to sit at the conference table.

Gentlemen, here is something I wish this committee would check into. In the 1944 Flood Control Act there is what is known as the O'Mahoney-Millikin amendment protecting the upstream States west of a line approximately here, any States lying wholly or partially west of this line and I forget the meridian line on it, shall be reserved for the upstream States. I think that that amendment, I heard Senator O'Mahoney give an interpretation of it, but I think it should be restudied by this committee to see if there is a violation of the O'Mahoney-Millikin amendment as far as the upstream States.

There is one other point that I would like to mention here. This is the Bonneville area here. The Montana Power Co. interconnects across here.

In the last years, and this is not too many years, we have had two large industries move into the State of Montana, and I am very proud of them. One is the aluminum plant up here at Hungry Horse, which has the power allocation. The other is the Victor Chemical Works at Butte, which has a very favorable rate.

In order for this great area here to grow to take up this population, to take care of these people that the mayor of Billings this morning

mentioned of 250,000 in the year 2000, we are going to have industry in this State. Or we can't put them to work. Montana is just barely holding its own. Senator Kerr, if you have got a lot of farms you well realize the gradual movement off the farm is terrific. This farming country, ranching country, it is getting to larger units. With that we have to have the same as over here, a reasonable and adequate supply of power. That is a must.

I don't know why that industry does not move over here. The only thing I can analyze is that power must be cheaper west of the divide than east of the divide.

Now, I don't want to take any more of your time. I know this hearing is running on. I think that Montana should have an allocation made in the State of Montana to irrigate all of these acres there are in the red right now. If we don't, you are going to find the dock facilities, you are going to find all the shipping interests downstream with their large investments are going to be able to come in any say, "You are crippling our investments if you give these people in the upstream States this water which is consumptively used."

I might be wrong in these statements.

I think that the Bureau of Reclamation has a lot of projects that can be made feasible. There are some of them small. I want this understood, pure and simple, that if the Montana Power or any other power can develop power cheaper or as cheap, just as cheap as we can by the Federal Government, I want them to develop it. But I want to know all the residuals that go with it. Recreation, irrigation, and other parts, because everyone of these damsites on this river are a precious natural resource that is only in certain spots of which we have.

Yellowtail down here, which we all know the Yellowtail Reservoir, which certainly got a lot of credit coming to that, they are furnishing all the water for that. Senator, you can see this river all gets down in Wyoming. Wyoming and Montana are putting in, as was stated this morning, 17 million acre-feet. Your next large river after you get away from the Little Missouri, and it doesn't have so much, it is down at the Platte, the big one that goes in to furnish any appreciable supply in the Missouri system.

I would like to see this committee also work to get a constructive program. I hate crash programs, as I stated this morning. Some long-range studies and some long-range plans. I think slack water navigation is one of your first studies to take in the Missouri system. Slack water navigation because we can't furnish enough for water streams.

Another thing I would like this committee to check, and I think you can do it. Montana, Wyoming, North and South Dakota being in the trout areas and, with the Government programs, has so many little stock water reservoirs taking from 5 to 150 acre-feet out of this water system that I don't believe we are going to flow the water that the engineers say we can flow.

That is the question that this committee should determine. How much of this is being held back in stock water reservoirs.

Senator YOUNG. I was concerned about the same thing. These watershed projects are very good projects.

Mr. MAHONEY. That is right.

Senator YOUNG. But they will curtail the flow to some degree.

Mr. MAHONEY. Yes.

Senator YOUNG. Of water to the Missouri and——

Mr. MAHONEY. Yes. We are not going to stop it. We have got the water here. Tell this man here in Garfield County he can't put a stock water reservoir in because you have got to cut down. But maybe through proper kind of evaporation, maybe we can let, instead of this dam from dry, it only goes half way down this year, then next year if it didn't evaporate out you only have to fill half of it in place of the whole reservoir. Surface evaporation is a very important point in this area, because if it comes to the time and it is coming where sanitation and human consumption is going to use so much more of that water than you are using today, then I think we are going to have to investigate that particular point.

I think with that, gentlemen, I will close. If there are any questions, I will try to answer them.

The CHAIRMAN. Senator, we have been delighted and inspired by what you have told us and we thank you.

Mr. MAHONEY. Fine.

The CHAIRMAN. Mr. George Lackman, region IX director, National Rural Electric Cooperative Association.

## STATEMENT OF GEORGE LACKMAN, REGION IX DIRECTOR, NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

Mr. LACKMAN. Senator Kerr, Senator Kuchel, and Senator Young, I prefer to read my statement, if I may.

The CHAIRMAN. Very good, sir.

Mr. LACKMAN. My name is George Lackman. My address is route 3, Billings, Mont. I am president of the Yellowstone Valley Electric Cooperative, Inc., of Huntley, Mont., and am vice president of the Montana State Rural Electric Cooperative which is the State association of rural electric systems in Montana. I also represent the State of Montana on the board of directors of the National Rural Electric Cooperative Association. And I might add I am further interested in the usage of water. I am vice president of the Billings Bench Water Association that has 20-some thousand acres under irrigation and also vice chairman of my soil conservation district.

The purpose of my appearance before this committee is to reemphasize the interest in the rural electric systems of Montana in a strong Federal water resource development program, and to impress upon this committee the economic indispensability of hydroelectric power generation to such a program.

During the year ending June 30, 1958, the rural electric systems in Montana purchased some 302 million kilowatt hours——

The CHAIRMAN. Read that figure again, 302——

Mr. LACKMAN. 302 million kilowatt hours——

The CHAIRMAN. All right.

Mr. LACKMAN (continuing). Of wholesale electric energy. Ten years ago less than 65 percent of the farms in Montana were receiving central station electric service. Today over 88 percent are so served. In 1949 the cooperatives in Montana were paying an average rate of 8.5 mills for wholesale energy. Today we pay only 4.7 mills.

The phenomenal growth of rural electrification in Montana over the past 10 years is largely attributable to one factor—the competitive impact on our wholesale power market of Federal hydroelectric dams and Federal transmission lines. In the 10 years since the inception of a strong Federal power program in Montana the rural electric systems in this State have multiplied by eight times their purchases of wholesale energy and have simultaneously cut its cost virtually in half.

These facts I think speak for themselves as to how the rural electric cooperatives of Montana have benefited from Federal power development. But what about the other side of the coin? Why is the sale of Federal power to rural electric systems indispensible to water-resource development?

Here in the Western States water-resource development is synonymous with land reclamation. This is the familiar scheme of impoundment and controlled release of water through systems of canals, ditches, and pipes. Under reclamation law, the investment of the Federal Government in irrigation dams, ditches, canals, and pipes must be repaid over a reasonable amortization period. But the farmers who purchase water from irrigation projects cannot always afford to repay the full costs of the dams, canals, pipes, and ditches necessary to bring the water upon their land. This is where the rural electric systems come in. The revenue derived from the sale of Federal power is used to repay to the U.S. Treasury whatever portion of the cost of irrigation works the water users cannot afford.

Let us examine, for instance, the Missouri River Basin project, which is the largest single land- and water-utilization program ever undertaken by the United States. The Missouri River Basin project will provide full irrigation water for 3.1 million acres of land and supplemental water for additional 676,300 acres; 68.3 percent of the total cost of the Missouri River Basin project, representing about $4 billion, is classified as reimbursable cost and must be repaid to the U.S. Treasury. Of this amount, $2.7 billion will be used to build irrigation works. But the water users will not be able to pay back this $2.7 billion which the Government will invest for their benefit. They will repay only about $408 million—15 percent of what the irrigation features will actually cost. The other 85 percent of the irrigation costs—$2.3 billion worth of irrigation cost—will be repaid by power sales revenue. Without this subsidy from power sales revenue, the Missouri Basin project would be impossible.

The same situation prevails with respect to the initial units of Colorado River storage project, where 60 percent of the $200 million of cost allocated to irrigation will be repaid from power sales revenue.

It seems abundantly clear, therefore, that the development here in the West of large-scale water utilization programs must be accompanied by the development of major hydroelectric facilities to supply the necessary repayment potential.

It is those Federal hydroelectric facilities which have made rural electrification possible in Montana, in most of the other Missouri River Basin States, and in the Pacific Northwest. But Federal hydroelectric dams alone will not by themselves insure the self-liquidating characteristics so essential to successful land reclamation projects. Nor will dams alone insure that the rural electric systems and other preference customers will enjoy the benefits of Federal power. In-

48186—60—pt. 3——5

dispensable to the effective marketing of Federal power, and indispensable to the enjoyment by rural electric systems of the benefits of Federal power are Federal transmission facilities. In the absence of Federal transmission facilities, the Government has only one customer for its power. That is the local investor owned utility company. And it has been amply demonstrated here in Montana, as in other States, that where Federal hydroelectric projects are isolated from Federal transmission facilities, the investor owned utility companies always seem to have more power than they can possibly use. Under these conditions, the company, of course, cannot afford to pay the full price for firm power upon which financial feasibility of the Federal project depends. The company is reluctantly forced to tell the Government that although it cannot use any firm power, it will, as a patriotic duty and out of a sense of loyalty to the United States, be happy to dispose of whatever power the Government cannot sell to anybody else—at dump rates of course. And there is no one else to whom the Government can sell in such a case. Rural electric systems and other preference customers derive singularly few benefits from this type of operation.

By contrast, in those cases where sufficient Federal transmission lines are built to interconnect generating stations and to deliver their output to the load centers of preference customers as well as investor owned utility companies, the companies seem to be faced with acute power shortages and loudly proclaim that the interests of everyone will be best served by delivering all Federal power to the company. The company is then only too glad to pay full firm power rates and to retransmit Federal power to preference customers. Thus, where Federal transmission lines are available, the Government encounters the pleasant prospect of having several customers bidding for its product at a firm price sufficient to repay the cost of the project. The rural electric cooperatives are able to choose between low cost Federal power delivered over low cost Federal transmission facilities and low cost Federal power wheeled at reasonable rates by an investor owned utility company anxious to preserve its monopoly.

The chairman of this committee, Senator Murray, is probably more aware than any man in the United States of how closely the wholesale power marketing situation in the State of Montana has followed this pattern. Before Federal power was available to rural electric systems in Montana we were paying in excess of 9 mills per kwh. And even after Fort Peck came on the line we were paying close to 9 mills per kwh in most of Montana. There were no Federal transmission lines at that time capable of delivering Federal power to the load centers of rural electric systems. The Montana Power Co. steadfastly refused to reduce its rates or to wheel Federal power to us. But, when the Havre to Shelby transmission line was finished and when funds were appropriated to build a Federal line to interconnect Canyon Ferry, Great Falls, and Fort Peck, then the Montana Power Co. not only reduced rates to us but simultaneously signed a wheeling agreement. That has generally been the pattern in every power marketing area throughout the United States.

Representatives of the Montana Power Co. will tell you that additional Federal power is unnecessary in Montana. The company will tell you that if Government should find it necessary to build additional Federal hydroplants to defray the cost of irrigation projects,

then the Montana Power Co. should be allowed to either install the generating units and purchase falling water from the Government, or to purchase at the bus bar the entire electrical output of the Federal projects. The company will tell you that because it now charges rural electric systems no more for wholesale power than does the Federal Government there is no need for additional Federal transmission lines.

This may sound very plausible, but I urge you to consider the effect on the rural electric systems should additional Federal power be denied them. For as surely as the company rates were reduced when the yardstick of Federal competition was injected into the wholesale power market in Montana, just as surely will those rates be increased if and when the yardstick of Federal power is removed.

In conclusion, gentlemen, let me reiterate two points. First, the rural electrification program in much of the West including the State of Montana, cannot grow and develop without an adequate supply of low cost Federal power. Second, it is financially impossible for the U.S. Government to undertake major reclamation projects without including in them hydroelectric facilities, the revenue from which is indispensable to the repayment of irrigation costs. And, as a corollary to both these propositions, the rural electric systems, and other customers entitled to preference benefits under Federal power law, cannot realize such benefits in the absence of a Federal transmission system, nor can the Government, in the absence of a Federal transmission system, except to market power from its hydroelectric generating stations at firm rates. These are the indisputable facts of water and power resource development in the West. Any program which ignores them is doomed to failure. Any program which encompasses them can do much to meet the unprecedented need for water and power which is the very justification upon which the existence of this committee rests.

That is all.

The CHAIRMAN. Thank you very much, Mr. Lackman, for a very fine statement.

## STATEMENT OF LEONARD KENFIELD, PRESIDENT, MONTANA FARMERS UNION

Mr. KENFIELD. Mr. Chairman and members of the committee, my name is Leonard Kenfield. I reside at Great Falls, Mont. I am president of the Montana Farmers Union, a statewide general farm organization with local organizations in 41 Montana counties and membership in 56 Montana counties. Montana Farmers Union is also part of the Farmers Educational and Cooperative Union of America, otherwise known as the National Farmers Union with membership in all the Missouri Basin States, among others.

I wish to express appreciation to you, Mr. Chairman, and the members of the Senate select committee for the courtesy of appearing here.

The action of the U.S. Senate in establishing this series of hearings is highly commendable. It is urgent that attention be focused on such a vitally and fundamentally important area of the economy as national water resources.

It is very fitting at this hour to recommend for passage Senator James E. Murray's resources and conservation bill, S. 2549, which

would provide a means of keeping the Nation up to date in annual reports on the entire water situation and other resources problems and programs. As I understand the measure it would create a conservation council similar to the President's Council of Economic Advisers. S. 2549 would declare a continuing national policy on conservation, development and utilization of natural resources so that the Nation would always be aware of its assets as well as its needs in the resources field. The measure would place responsibility for the continuing study on the Congress and the President and permit the Chief Executive to have reliable information on which to base legislative recommendations, take resource development out of the cubbyhole in the old shed on the back lot and put it right on the front steps of the house where we live for all to see.

This select committee meeting here today, however, will, we hope, give us a very useful report. Much of its value may be lost if there is nothing further done with it other than printing the findings. There needs to be an annual reappraisal of the information and data this committee brings together.

Already two very fine studies of former committees of distinguished Americans are gathering dust and haven't been heard of since their publication.

"A Water Policy for the American People" in three volumes is a monumental study done by the President's Water Resources Policy Commission and published in 1950. It is a most impressive job. It would be a valuable function of a resources council to update that study and keep it alive.

Another remarkable study, very close to us here in this region, is "The Report of the Missouri Basin Survey Commission" containing the findings and recommendations of a group of outstanding residents of the Missouri Basin. The report of that Commission was published in 1953; yet the work has been largely ignored.

The President's Water Resources Policy Commission said "Civilizations are built on a combination of water, land, and people."

While reviewing the Nation's water resources 10 years ago, the President's Commission found some very worthwhile achievements in developing our resource assets, but declared also:

> On the debit side, man's activities in exploiting nature also have been destructive.

We have used water badly, without proper respect for its natural cycle, turning it from a friend to an enemy. We have destroyed forest, leaving barren, denuded mountainsides from which rainwater and melting snow pour unchecked, we have overplowed and overgrazed our lands; we have dangerously increased soil erosion, allowing previous topsoil to be carried to the sea, muddying our streams, filling up our reservoirs, and increasing danger from floods.

> These are serious wastes—

continued the report.

> If they continue unchecked, they will impoverish us and our children. But it is the strength of a free society that it can recognize its mistakes. It is dynamic and flexible. In all parts of the country—among engineers, conservationists, farmers, householders, and other ordinary citizens—there is a growing recognition that we must conserve and develop, as well as use, our natural resources. And in conservation and development, as in use, water is the key resource.

In the past 10 years U.S. resources development has fallen far short of keeping pace with the needs of a rapidly growing population. If it were not for the momentum of the years before, the status of our resources would indeed present a dismal picture today. Real conservation progress has been thwarted by an overriding solicitude for private power companies by those in top administrative positions in our Federal Government. In too many cases resource programs for personal private gain are radically inconsistent with the public welfare and the future strength of our nation.

Now is the time, in my opinion, to take a new look at the resource picture and launch a bold, new resource-development program that will challenge American inventive genius and constructive energies and set forth an inspiring prospect to believers in freedom and democracy everywhere.

Here is what many thousands of farm families in the Montana Farmers Union had in mind when they adopted the 1959 policy and program last October in State convention in Great Falls, Mont.

Now, there follows, Mr. Chairman, Montana Farmers Union resolutions on soil conservation, a program which we strongly support.

We wish to commend the Soil Conservation Service for the tremendous job it has done in the past on the limited funds and with the limited personnel available.

We urge that increased funds be made available to the Soil Conservation Service for expansion of its technical and administration personnel.

We recommend continued work on the small-watersheds program and the more important job of putting soil conservation to work on the land.

We commend the joint statement of the chairman of the State ASC committee and the SCS State conservationist on teamwork and cooperation with ASC farmer fieldmen and county committeemen, and SCS area and work-unit conservationists.

We urge continued cooperation among all agricultural agencies in the promotion of soil and water conservation.

We believe that the very existence of our Nation depends upon how well we conserve our natural resources and especially the greatest of them all—the living soil.

### 160-ACRE LIMITATION

We believe that the benefits of new water supplies developed with Federal funds should be enjoyed by the greatest number of people. The aim of the present 160-acre limitation is to prevent the acquisition of large water rights for speculative purposes.

Therefore, we believe this limitation in the Reclamation Act should not be weakened or bypassed and the present laws be strictly enforced.

### PUBLIC POWER

We urge enactment of Federal legislation to establish clear Federal responsibility to produce, regulate, and control public power through programs of area development on the basis of all-inclusive support of a total national program.

We urge enactment of legislation to require the Federal Power Commission to license only those projects which are best adapted to improve or fully develop the water resources of a river basin to obtain maximum public benefit.

We condemn the giveaway of great damsites for private exploitation, at the sacrifice of tremendous benefits in flood control, irrigation, power generation, industrial growth, and recreation.

We condemn the Eisenhower administration for its role in the greatest of all giveaways—that of Hells Canyon. And we strongly recommend enactment of laws making it mandatory for the Executive to submit to Congress for prior approval any action it intends to take authorizing the building of dams by private interests.

Public power development provides competition with private power and sets up a yardstick for ratemaking.

We highly endorse the decision of the Federal Power Commission that costs of propaganda advertising be paid from company profits rather than being paid by the ratepayers as heretofore.

We believe these policies will bring about the wisest use of power resources in the best interest of all people.

### RIVER DEVELOPMENT

We urge immediate construction of Yellowtail, Libby, and Paradise Dams and construction of Federal transmission lines so that the power may be divided among qualified preference customers.

Regional development agencies should be established to assure proper use of Federal hydroelectric power and provide for maximum conservation and development of all multipurpose uses and benefits, including water for cities, industry, flood control, irrigation, recreation, and navigation.

We urge Federal generation and transmission of the power required for present and future needs of nonprofit electric systems and the use of the withdrawal clause to protect the rights of preference customers.

### RURAL ELECTRIFICATION ADMINISTRATION

We oppose legislation designed to increase interest rates on loans made to rural electric cooperatives. We urge legislation which would restore all loan authority to the REA Administrator, and we favor creating a separate department of the U.S. Government for the REA as soon as possible.

We support long-term amortization of REA loans. We urge congressional policy of authorization of adequate distribution and transmission loan funds.

We urge all rural electric cooperatives of the State to be active members of the State and national rural electric cooperative associations, and to place greater emphasis on power use and public relations within each cooperative.

Every effort should be made to promote the building of transmission lines from the Federal power dams to the rural electric cooperative associations of the State. We believe that cooperatives should be allowed to continue serving any powerload.

We urge that a national policy be adopted which would place all heavy transmission lines under laws regulating them as public carriers.

We favor expansion of the telephone program to serve all farm and ranch homes possible, adequately.

NATIONAL FORESTS AND PARKS

We recommend the following:

1. Expansion of State-Federal reforestation and technical assistance to be given to owners of small tracts of timberlands.
2. Continuation of the present method of selling timber by competitive bidding, but in smaller tracts, to make it possible for the small operators to bid.
3. Increased appropriations to improve access roads and extend them to mature stands.
4. Logging methods that are consistent with good conservation practices.
5. Jurisdiction over national forests remain with the Federal Government.
6. The efficient work of our Forest Service should be continued and expanded.
7. Immediate action to stop the deterioration through natural causes and citizen carelessness in our State and national forests and national parks.
8. Expansion of our public recreational facilities to keep pace with our rapidly growing population.
9. Our primitive areas should not be exploited by private interest, but left intact for coming generations to enjoy.
10. That sufficient funds be made available to maintain the system of Forest Service trails with special attention to reducing the hazards in the primitive areas.
11. That efforts should continue to be made for sufficient funds for proper, organized fire protection.
12. We urge that the Department of Agriculture appropriate more funds to the Forest Service to combat tree disease and forest infestation.

GREAT PLAINS AGENCY

Senate bill 2908 by Senator Carroll, of Colorado, setting up an overall plan for protection from floods and drought should be supported. The program of flood control under the Army Engineers and Reclamation Bureau has not been effective.

The establishment of the Great Plains Agency for 10 Western States is necessary and the support of our congressional delegation is urged.

And since atomic energy is part of our public domain and related closely to water and land, I am including that part of the Montana Farmers Union resolutions:

ATOMIC ENERGY

The United States must utilize to the fullest extent its technical and scientific knowledge in the development of atomic power to be used for peaceful purposes. We urge Congress direct the Atomic Energy Commission to proceed to this end.

We are convinced of the truth of Albert Schweitzer's "Declaration of Conscience" which states that the continuation of unlimited testing of atomic weapons means the ultimate destruction of mankind.

DOWNSTREAM BENEFITS

I wish to voice opposition to any efforts to give downstream money or power benefits to private power companies. Such practice would be a reversal of comprehensive river-basin policy which has been repeatedly affirmed by Congress for many years. The people own the rivers. Under Federal law a private power company may operate a project on a river only as a privilege. Along with that privilege the company gets a guaranteed profit on its investment and enjoys other safeguards. That the Federal Government should pay a private company for a benefit the Federal Government creates is not only bad business but it is wasteful.

Then I think we ought to consider seriously the establishment of a capital budget.

Mr. Chairman and members of the committee, I should like to recommend that serious consideration be given to the creation of capital-assets budgeting in Federal Government accounting. By this procedure the Federal Government would segregate expenditures for public dams, transmission lines, and similar projects and establish such expenditures as investments. This procedure would serve to reduce the Federal debt and give the American people a more clear picture of their public wealth. Capital budgeting would bring more businesslike handling of Federal financing.

Unfortunately, many citizens do not realize many Federal resource projects like Bonneville Power Administration, Tennessee Valley Authority, Hungry Horse Dam, and Fort Peck Dam are returning to the Federal Treasury funds spent in their construction plus interest on money often well ahead of the repayment schedules. Thus they are not Federal expenditures, but Federal investments. Meanwhile, these projects offer tremendous benefits to the entire economy and stand as monuments to freedom. This matter of Federal control is important in my opinion, too.

Furthermore, it is mandatory that Federal control and ownership remain paramount over navigable rivers, the noninternational offshore lands, national forests and parks, and other Federal lands. Unified management of great watersheds is possible only under single leadership, and since the Federal Government represents all the people, where can you find a more fair agency to do the job?

In addition, it is only through their Federal Government that the people can marshal the authority and the funds for full resource conservation and development. This, of course, does not preclude the necessity of coordination of programs with State, local, and private efforts.

In this connection I must warn there is danger in recently proposed legislation "to provide that withdrawals or reservations of public lands shall not affect certain water rights."

The vesting of water rights proposed in such legislation in the guise of ratifying State laws would jeopardize the national policy of safeguarding resources from exploitation, would tend to create chaos

in the administration of public lands, and would give a valuable windfall to corporations and individuals not necessarily entitled to them. Meanwhile many small landholders and farmers and ranchers would likely be frozen out of applying for the same rights on any equitable basis and actual water monopolies might be created without regard to the public interest. It would be timely for the Senate select committee to study the leasing program on the public domain not only to insure continuation of Federal supervision and ownership of all the resources but to strengthen administration of water and land use to encourage family-type agriculture in a manner consistent with sound conservation.

### PREFERENCE CLAUSE

It is vitally necessary that the preference clause now in reclamation law be retained in future water developments for public power so the citizens' equity in this God-given resource will be preserved. Unfortunately, administration of the law is seriously eroding the preference clause as Canyon Ferry Dam on the Missouri River so well illustrates. You heard that mentioned previously. There a private power company is absorbing practically all of the public energy into its own line, so I have been informed and the administration in Washington sits by allowing power-starved rural nonprofit cooperatives to be denied that enegy. Administration efforts to change cost allocations, to raise power rates to cooperatives and to pressure cooperatives into unwise longtime contracts are all methods of destroying the preference clause and of putting private profit monopolies in line for taking over the power produced at Federal dams. These efforts are warning that all who are interested in preserving the public equity in resource development should be on the alert to safeguard the preference clause and seek wise and just administration of the laws.

Right here I would like to say I think there is one thing that is often overlooked and that is that preference customers help pay a large part of the cost of the development of these projects.

The rivers of the Nation belong to all the people of the United States. The electricity generated at Federal dams from that water also belongs to all the people. The most direct way the citizens of the Nation can make use of their own hydroelectric power is through nonprofit cooperatives and nonprofit public agencies. Actually there is no preference in the so-called preference clause, only the right of availability of power as one authority on the subject declares, since the people themselves are the real owners. It is contrary to the public interest to give private profitmaking business corporations a special and monopolistic advantage in utilizing this precious resource.

### GROUND WATER

In regard to ground water we are told by F. A. Swenson of the U.S. Geological Survey that ground water is one of Montana's most valuable assets, and although its use is increasing steadily, few people appreciate its value. He says that our natural underground reservoirs represent a last reserve whose intelligent use can help tremendously in meeting the future population demands.

While there is much concern over surface water rights in Montana where the doctrine of prior appropriation is the rule buttressed by many legal findings and court decisions, ground water has been largely ignored.

We are also advised by competent authority in the resources field there are great unseen ground water reservoirs and that in some localities ground water flows a thousand miles through porous sandstones and that ground water is related to surface water in great river basins including our own here in the Missouri.

The report of the Missouri Basin Survey Commission published in 1953 said in a sweeping statement which included conditions in Montana:

> The law relating to ground water, as it exists today, is in a greater state of uncertainty and doubt than almost any other body of law.

In recommending adoption of State laws "that are consistent with our present State of scientific knowledge and that will not prevent progress as that knowledge develops," the Missouri Basin Survey Commission declared as follows:

> In the absence of such new legislation development will be either retarded because of lack of a firm legal claim upon the waters or, as has frequently occurred in other parts of the country, development may take place with startling rapidity and competition for the supply will lead to overdevelopment, complicated and expensive legal difficulties, and ultimate loss. The lawmakers must not stand by until irrepararble harm is done and then attempt to remedy a bad situation.

In developing a ground water code, where necessary, unlimited right to use should be qualified by public necessity, beneficial use and waste. One way to expand water rights is through water storage, conservation, and equitable distribution. A water right can be lost by loss of water through waste and neglect. All the courts in the Nation could not save a water right if the source of the water is dissipated.

Modern industrialization requires vast quantities of water. If there is to be any further industrialization in Montana, and many of us hope there will be an expansion of our entire economy, then great concern should be given to our water supplies so that all uses, and especially the health needs of the people, will get fair and equitable treatment.

The President's Water Resources Policy Commission, completing in 1950 an historic study of the water resources of the entire Nation, including the Missouri and Columbia basins, said:

> Practically all ground-water problems result from mismanagement, including excessive extraction or careless contamination. Much of this mismanagement derives from a failure to foresee results of uncontrolled development.

The President's Commission urged an integrated water management program by river basins and recommended:

> The best possible use of ground-water resources should be included as an integral part of comprehensive river basin programs, with clear recognition of the interrelationship between ground and surface waters and with due regard for the rights and interests of the States.

### WATER PROBLEM

Water is a real problem in semiarid Montana. In some areas the water table is declining; in other areas there is too much water. A stable supply of good domestic water is a serious need for a number of our communities and for many farm and ranch families.

The value of water for agriculture in Montana is emphasizd by the approximately 1¾ million acres of irrigated cropland. There is need for more water to irrigate cropland. There is need for more water to irrigate new acres.

Rural Montana depends on water to furnish power for many electric cooperative systems. There is a critical need for more power in Montana agriculture.

### ECONOMIC CONDITIONS

On the economic conditions, in terms of the business situation Forbes magazine in a recent issue listed the Great Falls-Butte area as one of the "worst performer" areas of the Nation. I would say in addition if it were not for the Federal airbase and farm price supports Great Falls would indeed be in trouble.

According to the U.S. Department of Commerce Montana economic growth is not keeping pace with that in many other States. A pictograph report from the Government department carried in the People's Voice, which is a statewide paper here in Montana, shows Montana 1958 per capital average income at $1,920 while the nationwide figure was $2,067.

I think you are familiar with the cost-price squeeze in agriculture.

The continuing cost-price squeeze in agriculture is steadily forcing an alarming number of people to leave their farms. They drift to the cities where there are not enough jobs for the city people. The lagging farm income in Montana and the region is undercutting the whole economy. Year after year of less than parity prices in agriculture are having their toll on the well-being of farm families and a large number of the population working in farm-related industries. Evidence of the farm economy slump is seen in the numbers who are abandoning their farms to the soil bank in many of our eastern Montana counties and in the States of North Dakota and Minnesota. This movement pressured by an unsatisfactory economy is damaging many rural communities. Most of those farmers will not be back and too many of their idle acres are growing up to weeds.

Montana is also plagued by a higher-than-necessary freight rate structure which has a depressing effect on agricultural and business opportunities.

Thus we need a burst of new economic activity that will bring new jobs, new farms, and new businesses and new hope. We need to get on with the task of developing our resources for all the people.

While the farm situation will best be improved by better laws that will offer rural people an opportunity to earn full parity of income, full resource development would provide a strong foundation of improved soil, more reliable water supplies, and more badly needed low-cost power. Besides better farm laws we need some real agricultural leadership in the administrative positions in Washington.

POWER POTENTIAL

The Northwest Public Power Association has estimated that the Nation has a potential of 135 million kilowatt hours of electrical energy but only 26.5 million had been developed by January 1, 1957. The Nation has some 108 million kilowatts of idle, wasting power resources. Only 13 percent of Montana's waterpower potential has been developed. I am sure that information is based on data supplied by the Federal Power Commission. The low-cost public power areas of the United States are the Tennessee Valley and the Pacific Northwest. Twenty-two publicly owned utilities in Washington and Oregon operate so efficiently they are able to provide their consumers with power at 1 cent per kilowatt-hour. I don't know of any private power companies doing so well. In the Tennessee Valley there were 62 1-cent club members in 1958.

Low-cost public power brings many benefits and offers an immeasurable yardstick value for electrical energy. Of course I think it is well brought out here already, that there is low-cost public power, is very important in the rural areas.

Construction of more public power facilities is an urgent matter in this region as it is in the Columbia and other regions. Many of our thousands of Farmers Union members are members also of rural electric power associations whose sources of power are woefully inadequate to meet the growing needs for energy in agricultural production and living.

Agriculture today is using increasing amounts of electricity for lighting, for living conveniences in the farm home and for power for irrigation and hundreds of other uses.

Vitally important also is the need for more power at lowest possible cost. With operating costs rising, many rural cooperative distributing systems must have power at the lowest price to keep solvent. Rural electric cooperatives serving many isolated high-cost areas must operate on extremely narrow margins. Thus with very little headroom financially, many of these associations absolutely require cheap power and abundant power.

Firm people, of course, look to industrial growth as a factor in agricultural growth. Thus low-cost public power that stimulates industry makes jobs available for workers who buy beef, mutton, pork, cereals, milk, and many other agricultural commodities. There is a direct relationship between farmer income and industrial worker income.

If American farm people are to clothe and feed our population, which is growing at the rate of about 3 million people a year, they will need much more electric power. It is estimated the U.S. population will exceed 200 million by 1975. To meet the big feeding job ahead, farmers will require much more low-cost electric power that is possible only from Federal dams and generating plants. They will need low-cost power for making fertilizer and for irrigation. They will need low-cost power to make the land area available for more productive cultivation.

NEED FOR FOOD

Some people of this Nation seem to feel smug and secure behind a lot of loose talk about agricultural surpluses. Actually, much of the surplus we hear about is mythical.

It is a hard fact we cannot ignore, and we must not ignore that productive land is limited in quantity, and the population is growing with amazing rapidity.

Here is what the Honorable George Dewey Clyde, Governor of Utah, said a few months ago in a speech before the American Society of Engineers:

> Let us begin by taking a brief look at the agricultural surpluses which we now have on hand. While the accumulated piles of commodities may appear mountainous—and in a few special areas they are—the excess agricultural products we have on hand amount, I have been told, to about 7 percent of our annual food consumption. Now it has been widely urged, by leaders of civil defense and others, that each U.S. family lay in a 1-month supply of food against a possible emergency. If this were done, if each family set by a single month's supply of food, our surplus would be entirely wiped out, and we should be faced with critical shortages. As a matter of practical fact, I am not suggesting that each family will set aside a month's supply of food—but this simple illustration shows how quickly our food surpluses could disappear.

In another part of his speech Governor Clyde, who was showing the need for more reclamation development in the Nation, underscored the food problem with this revealing statement:

> Not so long ago, Dr. Byron Shaw, who is Administrator of the Agricultural Research Administration of the Department of Agriculture told a congressional committee that if our demand for red meat continued on the 1933 per capita consumption—and it is increasing—that by 1962 we should need 35 million acres more land devoting to the raising of feed than were in production in 1953. This is land for pasture and grazing and for the growing of feed grains.

He raised the question, Where are we going to find 35 million acres of suitable land?

The whole point is that land is limited and that we are being pressed to make better use of the land we have. In the technology of change and improvement in agriculture, low-cost electricity is a key factor. We have seen that factor clearly demonstrated in the Tennessee Valley under the TVA, in the Columbia Valley under the Bonneville Power Administration, and elsewhere in the Nation.

### COMPREHENSIVE DEVELOPMENT

In brief the legislation urged here should:

1. Provide a vehicle for more comprehensive development of the river basins and give fresh impetus to agricultural and industrial growth in the entire economy; and
2. Decentralize Federal authority and give the people of the region a greater voice in shaping that development and at the same time afford a more responsible control than comes from private utilities whose authority reaches out from eastern financial centers.

### CONFLICTS IN RESOURCE DEVELOPMENT AND USE

You have heard in a very forceful way the serious conflicts in resource use here just a few minutes ago from Senator Mahoney. At the present time there is a conflict between upstream and downstream users of low-cost power in regard to distribution of the meager supplies. Related to that conflict is another one involving use of upstream water to float downstream barges. The old conflict between upper basin irrigation needs and downstream uses has never been

satisfactorily settled. In summary, water supply in the basin now is not sufficient for all the useful purposes it can serve.

Floods, drought and pollution are persistent and annoying problems in the basin.

THE WHOLE RIVER

Every stream should be used to its utmost—

declared the President's Commission.

No stream can be so used unless such use is planned for in advance. When such plans are met, we shall find that instead of interfering, one use can often be made to assist another. Each river system, from its headwaters in the forest to its mouth on the coast, is a single unit and should be treated as such.

UNIFIED WATER COORDINATION

Legislation should be enacted to provide for unified water coordination and control and resource development on the Missouri River and its tributaries and entire watershed, to prevent floods, develop low-cost hydroelectric power, irrigate lands, develop fertilizer, encourage agriculture, stimulate business and industrial expansion, improve navigation, preserve and develop recreational possibilities, protect wildlife and to foster fuller utilization of the water, land and forest resources of the region for the purpose of stimulating sound, longtime economic activities within and among the several States of the basin and to promote the general welfare of the United States.

Again the President's Commission:

Each one of us lives in a small watershed. Citizenship in that watershed makes us citizens of the larger river basin of which it is a part. Each one of us should feel a direct responsibility for the cooperative management of our watershed, to make sure it plays its proper part in storing the water which falls upon it.

MISSOURI VALLEY RESOURCE CORPORATION

I strongly recommend the establishment by Congress of an overall coordinating agency in the form of a Missouri Valley Resource Corporation as an important first step in sound management of the development of the resources of the basin so that the people of this region and the Nation will realize the greatest possible benefits.

The CHAIRMAN. May I ask you a question, Mr. Kenfield?

Mr. KENFIELD. Yes, sir.

The CHAIRMAN. I have been reading along with you and a paragraph or two maybe ahead of you. I gather that the gist of this is actually the framework of what we might refer to as the Missouri Valley Authority?

Mr. KENFIELD. Yes, sir.

The CHAIRMAN. Go ahead.

Mr. KENFIELD. Within the Missouri Basin this public corporation would be directed by a board of five members appointed by the President with the consent of the Senate with power to prepare and direct the development of land and water resources of the entire region.

It is essential that the appointees to the Board be legal residents of the States that fall wholly or partly within the Missouri Basin and that the principal office of the corporation be established within the basin. Partisan political affiliations should have minor consideration

or none at all in selecting the appointees but ability and competence in the resource field should be of major concern. No member of the Board during his term of office shall be permitted to hold other public office, be engaged in any other business or have a financial interest in any corporation or other enterprise that might adversely affect the activities of the corporation. Recruitment of staff members should be based on merit alone and while the Board would establish its own recruitment and personnel policies, it is recommended that the Federal system of retirement be retained allowing employees transferring to the corporation to retain their retirement benefits earned through prior Federal service.

The Board should have power to direct and coordinate the activities of all Federal agencies relating to resource development within the basin, incorporated into the basin present plans and programs of existing agencies to the extent they are compatible with full development of the resources of the basin.

This does not mean the elimination of any Federal or State agency where its work contributes to the full and comprehensive development. It does mean the Board's task would be to harmonize and reconcile the interrelated features and purposes of the whole development program so as to achieve diversified development, progressive growth and stabilization and strengthening of the economy of the basin in order to bring about the maximum benefits possible for the welfare of the people of the basin and the Nation.

The Board should be responsible for implementing the policies of Congress in regard to land and water use by exercising central control of river operations, directing operational plans, for other resource facilities, and preparing coordinated plans in connection with agencies concerned with flood control, irrigation, power production and distribution, and recreation, among other activities.

In addition, the Board should have authority to construct and operate electric power production and distribution facilities and to coordinate already established congressional policies governing power marketings and power system operations.

The Board should be permitted to use the services, facilities, and personnel of any Federal agency in carrying out its functions and the agencies should be authorized and directed to cooperate with the Board within the scope of the regulations and authority established for each. The Board should have the authority to employ qualified private firms or individuals to aid in carrying out any of its functions and at the same time have authority where necessary and feasible to utilize force account operations. The rights of labor should be assured.

The Board at all times should seek the advice and the participation of the people of the basin, the State and local governments, State agencies and educational and research institutions and public and private organizations in carrying out its functions.

It is recommended that there be established an advisory committee of responsible citizens representative of the people of each State concerned to consult with the Board in regard to general resource development policy, to review programs and to help plan coordination of basin activities with State activities.

### BROADEN TAX BASE

This whole program, it seems to me, would broaden the tax base. It would be highly desirable that public multipurpose dams constructed and managed by the corporation provide payments in lieu of taxes to counties and State governments. Full resource development in the basin would broaden the tax base by providing thousands of new personal incomes and greatly augmenting current ones; out of such development would come improvements and additions to private property holdings thus increasing the taxable valuations.

A statement was made here earlier, Mr. Chairman, something to the effect that Federal projects did not contribute to tax structure. As a matter of fact, it is a matter of record over in Flathead County where Hungry Horse Dam is that the taxable valuation of the property over there rose from about $35 million to something over $80 million since the construction of Federal Hungry Horse Dam.

If the thorny downstream navigation problem persists, I would recommend consideration of the system of slack-water canals and locks advocated by the late Col. Jerome Locke in place of the wasteful free-flowing channel now used.

The regional river corporation represents an effective means of decentralizing Federal administration of resource development. At the present time numerous bureaus and agencies operate from Washington, D.C., in an uncoordinated manner without as much concern for local and regional people as they should have. The regional corporation brings government closer to the people. Local people through their Congressmen, Senators, and President whom they elect would have a voice in the program and the citizens' regional advisory committee would be a democratic factor.

The CHAIRMAN. Good.

Mr. KENFIELD. Now, how would it be paid for? The project would pay for itself to a large extent. TVA is paying off and so is Bonneville Power Administration out West.

How would we get the money to start a regional development project? Some of it from Federal appropriations and perhaps some of it might come from issuance of revenue bonds.

If we could take about one-sixth of the military budget of $40 to $50 billions a year, we could finance one TVA a year. We could go a long way on multipurpose resource development in the Missouri Basin with $7.5 billions. I'm sure there's a lot of fat in the military budget—fat for General Motors, Big Steel, Big Oil, Big Rubber.

I know there is a lot of waste in the military budget.

### CONVERT WASTE TO WEALTH

Here is an AP news story dated March 14 of this year, Washington:

**The Defense Department which gobbles a huge share of the Nation's budget wrote the equivalent of at least $7,500 million off its books last year.**

**One billion of that was spent for goods the military didn't need and couldn't use. And, though brandnew, the stuff was ultimately sold for about 8 cents on the dollar.**

**Most of the $7,500 million was spent on weapons and equipment which the services considered as either obsolete or wornout and therefore useless.**

Seven and a half billion dollars wasted!

On what the Army throws away we could rebuild this great region!

TVA has caught the imagination of the world as one of democracy's showplaces in the resource-development field. It has survived more than 25 years of onslaughts by the power trust, patiently building the region and paying for itself. It is one of America's great assets.

We are now engaged in costly rivalry with a formidable nation in seeking achievements in interstellar space. I'm thankful, however, for that kind of international contest costs very little in human blood. The excursions into the no man's lands of the universe are dazzling to the imagination. I am sure they take a lot of tax money.

Let's get down to earth and launch a project equally as challenging. Full resource development might help us preserve our present planetary abode from becoming another mere cinder in God's heaven.

A vigorous and dynamic resource-developing program would help save the equities of thousands of small property owners in the region and prevent further distress and embarrassment to families of workers, farmers, and small business people.

How fascinating it will be to fashion a democratic instrument to enable the people of the valley to control the full development of their tremendous natural resources for all! Not one pound of payload need be wasted here. The payoff would be thousands of new jobs, new businesses, new farms and a new spirit of hope among our people. It would be a thrilling adventure in expanding self-government.

Thank you kindly for your attention.

The CHAIRMAN. Thank you very much, Mr. Kenfield, for a very challenging statement.

Frank A. Swenson, U.S. Geological Survey.

Yes, Mr. Swenson.

## STATEMENT OF FRANK A. SWENSON, U.S. GEOLOGICAL SURVEY

Mr. SWENSON. I am Frank A. Swenson, District Geology Ground Water Branch of the Geological Survey.

I had not intended to be on the program but this morning Mr. Rick of the Soil Conservation Service and several other people noted a downplaying of our ground water resources in Montana. Mr. Rick could not be here after lunch. He had to attend a meeting. So he asked me to take his 5 minutes and I will try to cover the subject in that brief time.

The Geological Survey, as you know, is a factfinding scientific and factfinding organization, engaged in determining the water resources, among other factors, of our Nation.

Since 1946 I have been engaged in making ground water investigations in the State of Montana and we have covered quite a number of areas.

The blue areas are those areas covered in the State cooperative program with the Montana Bureau of Mines and Geology. The red areas are those covered under the Missouri basin program. The red line areas are those areas which are still being studied as part of the Missouri program for development of the land and water resources in the Missouri Basin.

The statement was made this morning early by Representative Anderson that we had been unable to find any ground water resources

in the State of Montana. During the past 14 years we have found vast ground water resources in Montana which are a surprise to many folks, for when I first started my work here it was a belief of many that we had no ground water in the State of Montana.

I have on this map those areas in red where wells capable of 250 to 1,000 gallons per minute can be obtained from shallow sand and gravel aquifers. (Map too large to reproduce here—is on file with the committee.)

Senator KUCHEL. Good quality water?

Mr. SWENSON. Excellent in most cases.

Senator YOUNG. How deep are those wells?

Mr. SWENSON. They range in Gallatin Valley where we have the most information here, the aquifer is 400 feet thick. Within 100 feet of surface we have 300 million acres of ground water available. An annual crop of 280,000 acre-feet of water entering the ground water area each year and draining out. The Bureau of Reclamation proposal in the Gallatin Valley, this area here, calls for development of 193 wells, to develop close to 100,000 acre-feet of water for irrigation purposes. We have completed a study in the Gallatin Valley, a complete hydrologic study. The report is now in the Government Printing Office and should be available in a short time. It has been released to the public in an open file and there is a great deal of information that has been put out on this subject.

Senator KUCHEL. Are the ground water sources independent and separate from the surface runoffs which you have?

Mr. SWENSON. They are not independent, no. These aquifers that I speak of are in the unconsolidated sand and gravels. Much of our research in Gallatin Valley is derived from water spreading of surface irrigation today. We do have those water resources available. In the central part of the valley where most of the water is available they have the early water rights. By transfer of rights or by loaning out of the rights the surface water can be put on the higher lands which are now short of water and those lands in the central part of the basin can depend on the ground water supplies.

Senator KUCHEL. There was some statement made by one of the witnesses this morning that some of the municipalities were required to obtain their municipal water from rivers because of the high mineral content.

Mr. SWENSON. Most of our highly mineralized water is associated with our ground water supplies in bedrock. In the eastern part of the State, principal towns, Billings, of course has entire surface water suply. Lockwood, across the river has a ground water supply. Miles City has wells. It is chiefly surface water from the Yellowstone River but they have supplies from wells. Glendive has a similar situation; Sidney, entirely wells. Snowden up here has a well but mainly river to supply; Plentywood up here, entirely ground water; Scobey entirely ground water; Poplar entirely ground water supply; Wolf Point, entirely ground water, Glasgow, and so on. But the bedrock supplies are of rather poor quality, being high in sodium salts, quite largely.

The CHAIRMAN. What?

Mr. SWENSON. High in sodium salts.

I don't want to take any more of your valuable time, but ground water is without a doubt one of Montana's most valuable, least known and appreciated natural resources. We have vast supplies of ground water. Development is just starting. In the past year there have been better than 30 irrigation wells drilled in the area between Frazier and Poplar in here. There are irrigation wells in many places in the State. This map that I have shown is based on the existence of wells today capable of these yields.

Senator YOUNG. The cities and towns you mentioned had a ground water supply are all along the rivers or streams aren't they?

Mr. SWENSON. That is right.

Senator YOUNG. And associated with the surface water?

Mr. SWENSON. That is right.

Senator YOUNG. How about the situation away from the river?

Mr. SWENSON. Away from the surface water, of course Circle out here has a ground water supply. Jordan has a new ground water supply. Roundup has ground water supply. Actually, I think the State was somewhat ambiguous. There is a problem of poor quality water in those areas and for future developments they may need larger supplies of water than they believe is available from the ground water sources. So the appeal was to continue to have water coming down our main streams. But today a large part of the water supplies, municipal water supplies in all of Montana and eastern Montana included is derived from ground water supplies. The major cities, that is, Great Falls, Billings, and Butte, all have surface water supplies. Missoula has a joint supply. Montana Power has, I believe, 15 wells in the city of Missoula, and all of the areas south of the Clark Fork River is supplied by means of the wells. We have the Rattlesnake Creek supply also. But we do have large ground water supplies. I would like to correct that impression that may have been left.

Thank you.

The CHAIRMAN. Thank you very much, Mr. Swenson.

Dr. Wilson F. Clark, vice president of the Montana Conservation Council and professor of science at Eastern Montana College of Education.

## STATEMENT OF DR. WILSON F. CLARK, VICE PRESIDENT OF MONTANA CONSERVATION COUNCIL AND PROFESSOR OF SCIENCE, EASTERN MONTANA COLLEGE OF EDUCATION

Mr. CLARK. Gentlemen, Mr. Rick, the president of our Montana Conservation Council, was going to give a very, very brief introduction as to what this council was, but as Mr. Swenson mentioned he had to leave for Bozeman. So if I may, I will give just a very brief, 1-minute thumbnail sketch of the council so you will see the context in which this testimony is given and then I will read the very brief testimony from the council authorized by its board.

The Montana Conservation Council is a citizens' organization devoted to helping the public understand conservation needs and problems. It serves as a forum for discussion and a meeting ground for the many diverse conservation interests. In its 11 years of life the Montana Conservation Council has been an active force in building

up the citizenry in Montana awareness of conservation needs. The council through the nonpolitical nature of its activities has earned and enjoyed the cooperation of institutions and agencies, State, Federal, and private. As a matter of fact, most of the gentlemen that have spoken here today are either members of the council in purely membership capacity or have been involved in our forums or our discussions or our programs.

The council has been instrumental in the past in building public understanding of and support for certain broad programs such as the development of the State's pollution legislation and the development and strengthening of the State foresters program. In general, then, the council provides an opportunity for the nonprofessional as well as the professional conservationist to participate through public forum and study and discussion of conservation problems and continues to endeavor to educate the public to the council's motto of conservation is everyone's business.

That is the purpose of the council, gentlemen.

The testimony that I would like to present on behalf of the board of directors of the council now follows.

The testimony of these many people heard here today points up several problems: (1) the need for broad water development; (2) the need for coordination of this development; (3) the rather deep conflict of interests existing between groups and agencies; and (4) the diversity of opinions as to the approaches best suited to water resources development.

The testimony offered by engineers, agricultural groups, business interests, power interests, agencies, and others all will contribute, in varying degrees, to our knowledge of the problems related to water. But we must all remember that water cannot be considered as an isolated resource; it is an integral part of and results from the other resources of range, forest, and soil, and is a vital concern in considering fish and wildlife and other recreational needs. We must consider all resources as inter-related. At the same time we should recognize whenever multiple use is proposed, priorities of use must be established, since diverse uses often collide and conflict in multiple-use programs.

The Montana Conservation Council, in fulfilling its entirely nonpolitical function of stimulating public understanding of broad conservation problems, sees present-day resource development as a confusing conglomeration of programs, plans, and publicity. Each may have merit, and much good work has been done, but the composite picture of all programs which cluster under the title of conservation is truly one of chaos. Some of the reasons for this chaotic state are somewhat understandable, considering the piecemeal growth of programs, the often fierce budgetary conflicts of agencies, the economic and political forces supporting or opposing moves, and the general state of confusion which exists in the public mind, as you gentlemen can well appreciate on the basis you have been gathering. Some other reasons for this chaotic state are inexcusable. In particular, conservation agencies must recognize that each one's program is but a small part of broad resource development, which is, after all, the continuing goal. Too many programs are now clutched possessively. Many agency personnel, from top to bottom, do not seem to see the need for

real integration of efforts. And as a final contribution to this chaos, agencies in many cases seem to have lost sight of the fact that their primary obligation is to the public, and not to the perpetuation of the agency.

The council feels that this is a time for needed assessment. An important part of this assessment is embodied in the provisions of Senate bill 2549, which, if enacted into law, will contribute markedly to the advancement of sound resource management.

But another important part of this assessment points out that it is time for all of us to recognize and admit that without public understanding and support, a conservation program, regardless of worth, cannot succeed. It is a time for agencies to enter into truly cooperative action, and to remove the artificial barriers which now inhibit genuine cooperation. It is a time for individual agencies to recapture positions of dynamic leadership, based on genuine public understanding. It is a time to develop competent, well informed, dynamic lay leadership and support on the local level. And finally, it is time for agencies to fulfill their obligations and responsibilities to the public, by training their personnel so that each will have a broad view of conservation goals, an understanding of his part in achieving those goals, and a recognition of his personal local community obligations for building public understanding.

It is these actions for which the Montana Conservation Council enters its testimony today. With such an approach, sound resource development can progress rapidly. Without them, piecemeal solutions, interagency jealousy, and public ignorance will continue to rule.

The CHAIRMAN. Thank you, Mr. Clark.

Mr. Tom Deckert, president of the Montana Wildlife Federation.

I want to announce that Mrs. M. Y. Foster, president of the Montana League of Women Voters, whose testimony I looked forward to with considerable interest, was scheduled to appear here but I am advised that she will appear before us in Missoula on Monday.

All right, Mr. Deckert.

## STATEMENT OF TOM DECKERT, PRESIDENT, MONTANA WILDLIFE FEDERATION

Mr. DECKERT. Mr. Chairman and members of the select committee, my name is Tom Deckert. I reside in Billings, Mont., and I am president of the Montana Wildlife Federation.

My presentation will be on recreation, gentlemen.

Much has been said and written on the need of land for farming, land for grazing, land for watershed protection, land for parks, land for impoundments, land for recreation, and land for many other specialized uses.

Much has been said and written on water and its many uses—water from the sky, surface water, and underground water.

Ignorance of economic values in the womb of the silent land with its forests, grazing lands, and watersheds, the fundamental strength of democracy, is almost frightening. Yet an increasing number feel the spell of its majestic power and would move heaven and hell to preserve it.

We must all have more knowledge of the economical and esthetic values before we can assume the role of the evangelist. All industries and some members of the public agencies must cease looking down their noses at the rank and file of God's patient poor who desire some elbow room.

Land is not one separate and water another, nor is the uncountable multitude of beings that live and grow and die on the combination of land and water a third thing. The three—land, water, and living things—are a single fabric, a trinity.

As we develop our standard of living, we become more and more specialized. That is why we have so many studies on the need of land and water for special purposes. We have come to the stage in our national development when we need more than ever the services of a general practitioner, one who can bring these many special interests in water and land uses together and come out with an overall program. The overall program cannot be based on past practices or present day conditions. It must be based on projected requirement and anticipated changes in people's habits and advancements in living standards. Increase in living intensity must be balanced with leisure time. Improvement of living standards requires increased productivity, and as we increase our pace, we should be sure we are in condition to go the full distance. The following is quoted from an article which appeared in the Billings Gazette on September 5, 1959:

> Physical fitness of Americans should be improving with increased knowledge of dietary needs, food in surplus supply, and greatly increased leisure time. Statistics provided by the military fail to bear out this theory, and on the contrary indicate that Americans are a weakening race. Changes which have taken place in all phases of American life within the last 60 years or so are highlighted by an excerpt from a speech delivered by Theodore Roosevelt in 1891: "Our country calls not for the life of ease, but for the life of strenuous endeavor. If we shrink from the hard contests where men must win at hazard of their lives and the risk of all they hold dear, then the bolder and stronger people will pass us by and will win for themselves the domination of the world," he predicted. "Let us therefore boldly face the life of strife, resolute to do our duty well and manfully—resolute to be honest and brave, to serve high ideals, yet to use practical methods."

A strong, healthy God-fearing and God-loving people are this Nation's greatest asset. The great outdoors provides the atmosphere where bodies are made strong and minds become alert to all surroundings. Public areas where people may enter into the activity or recreation of their choice must be considered in all planning, for today and projected plans.

Recreation is defined as a refreshment of strength and spirit after toil. With this in mind, we should never lose sight of the Trinity, which includes all living things, in development programs. While recreation is of major importance, we must not be interested to the extent that it is the only important type of water or land use. Likewise, other interests in planning for other special uses cannot overlook land and water needs for recreation.

It is unforgivable when a political authority approves any kind of a water or land use plan without taking into account all of the component parts involved. Preservation of special interests, such as historic sites, memorials, objects, natural wonders, scenic and scientific areas, should be included in all future planning.

It should be recognized that the practice and art of nationwide planning is still in its relative infancy. It is still struggling to evolve principles which will keep in tune with the tremendous changes that are now taking place in this country of ours. We see, read and study all this, and we hear figures on how fast the population is increasing—yet the total impact is hard to comprehend. What does it all mean? What must be done if we are to keep America the Beautiful—the land of opportunity, the opportunity to enjoy the natural beauty of the country, its streams and lakes and ocean shores, its woods, its fish and wildlife, the great open spaces, its mountains, its natural wonders and its wilderness?

There is an immediate urgent need to set aside a lot more land and water areas for parks and recreation purposes. There is need for areas to be set aside, a lot more land and water areas for parks and recreation purposes. There is need for areas to be set aside along Federal interstate and defense highway systems and in the more remote sections of our country. Access to public-domain lands should be in the projected planning and development programs, where recreation is of high value.

There will be a need for full cooperation of departments and agencies, with inventories and appraisals of suitable lands and waters for recreation purposes. The enlargement of an inservice training program for personnel of departments and agencies could help—one where they might see the whole picture instead of just that for which they were specially trained. They should also be sympathetic toward future planning that will benefit all people.

This is not meant to imply that we do not need specialists. We do need them; but we need engineers, agricultural experts, economists, foresters, range managers, and wildlifers who will first view the whole ecology of the land—men who will weigh values regardless of their specialties.

We need multiple use, and as yet we are a long way from any true concept of multiple use. Too many land managers with specialized training are prone to talk multiple use, but continue to practice their own specialty. This can result from early training, personal inclinations, or the policies they are hired to carry out. There are times when rangemen, the Soil Conservation Service, and the foresters are in competition with one another, and often all three are in competition with wildlife managers and directors in general.

All categories of specialists need better schooling in the fundamentals of multiple use. Multiple use will only be a fancy term to use in speeches unless there is land classification, because multiple use does not mean equal use. On public domain, for example, the priority on forest lands should be watershed management, saw logs, and other raw materials, with other uses taking a well-ordered secondary place; other forest lands can justifiably be classified as recreational land, while still permitting the harvest of a substantial timber crop. Public grazing lands should be classified in relation to livestock and big game; still other public domain, as wilderness.

Our conservation planning on all levels must seek aggressively to avoid past catastrophes, and it is the bounden duty of every citizen to examine and appraise our conservation leadership. If that leadership is not of the highest standard of intelligence, understanding, and sympathy, then it should be repudiated.

We should all be reminded that livestock can overgraze a pasture, that deer can overgraze a forest, and that people can overgraze a continent. At present there are over 170 million people in this country of ours. The Bureau of Census estimates that if the present rate of growth continues, there will be 57 million more people in these United States by 1975; and, if the trend for the past two decades continues, most of them will be living in and around our metropolitan areas. In the past 6 years, the rate of growth for the standard metropolitan areas has been about four times as rapid as that for the nonmetropolitan territory. Are these people to be like ants rushing back and forth in a maze of streets or along the superhighways, continually seeking something but not knowing what? I am sure all of us want something much better than that for our children and ourselves. We know that while people are essentially gregarious, they must be able to find privacy and solitude, preferably in the out-of-doors, if they are to mature physically and spiritually.

Edgar Ensil Mowrer has written:

> So far in history people seem to have derived beauty from two things—nature, primitive or cultivated, and the nature-inspired products of man's own mind and hands. Where would they seek it, if a growing population should cover most of the earth with utilitarian devices and desecrate the remainder in the process?

The need for preserving natural areas and providing recreation areas for public use has been recognized for a long time. The inadequacy of parks and recreation areas cannot be blamed on our not knowing their values, but rather on a reluctance of many people to forego the special uses for monetary gain.

Let's take a look at what States are passing up by not recognizing the tangibles of their recreation resources.

Markets: Look at the food industry of our own State, for example. Two years ago, Montana visitors, taking advantage of our facilities for their recreation, consumed in the short space of 4.3 days some 81 million pounds of food, while our own citizens in the same length of time ate only 17½ million pounds. When a single source can provide our farmers, dairies, ranchers, and truck gardens with more than 4½ times the market they would have if they merely fed Montanans, we have a very tangible value that we cannot afford to lose sight of. Consider that this is a market which comes to the producer, and you have a still greater value. In the light of this market, which is attracted by our recreation opportunities, it is easy to see why the Montana Beef Council aimed much of its advertising at the recreationist to whet his appetite for Montana beef.

Highways: No visitors looking for our recreation facilities can possibly avoid stops at Montana filling stations. Every time an out-of-State car fills its tank, tax funds for Montana highways are rung up. Then consider what the 3½ million visitors paid in gasoline taxes for highways a couple of years ago, supplemented by Federal funds, and you have a total of $8,300,000 available for highway construction as a result of the search for Montana's recreation attractions.

Jobs and business opportunities are also increased when these recreation seekers come our way. The 3,600,000 visitors in 1957 spent a minimum of $93 million in Montana at the rate of some $6.15 during an average stay of 4.1 days. There's money that finds its way into every Montanan's pocket and boosts the entire State's economy. The

traveling public are people, as well as recreation seekers and visitors. They live someplace, and they choose the place they live because they find work to do in surroundings they like, and people they like. Many return to make their homes in Montana, adding too our tax-paying citizenry, creating a permanent market.

With recreation opportunities, we have a happy working people, healthy and contented. You have a place that industrial leaders look at when they consider expansion of their plants and establishment of new plants. For many years, Florida and California beckoned to the tourists. They came and industry followed, and today Florida and California, along with New York, New Jersey, Michigan, and Texas—the top six tourist States—do over one-third of all the country's manufacturing.

The tourist business, the business of attracting visitors to our State to enjoy the wonderful recreation facilities we have, is an industry itself. The U.S. Department of Industry, at the end of 1957, reported that the tourist business in the United States totaled $15 billion to $20 billion a year. The Department noted that a town that can attract an average of only 50 visitors per day has the equivalent of a plant with a $200,000 annual payroll—quite a tangible asset to any community. Our recreational industry can be expanded by development of sights for them to see and enjoy along the way—parks and areas where they can relax, facilities for the visitors to use between their picture taking, fishing, hunting, hiking, boating, and other uses of our natural recreation opportunities. When we see how many visitors enjoy our boating, hunting, hiking, and the natural wonders of our great outdoors, we realize the value of conserving and developing all that we have for our own citizens to enjoy and our willingness to share all that we have with all people.

Then there are the intangibles, the values and benefits that no one can place the dollar sign on.

There is need for expansion and development of recreation areas at the local, State, and national levels. This calls for a nationwide program of analyzing our needs.

There is evidence that we are being led from darkness to light. With the Recreation Resource Review Commission and the Select Committee on National Water Resources set up to evaluate and make recommendations for nationwide planning and conservation of natural resources, the first great step for nationwide planning has a real chance of becoming a reality. It is hoped that with cooperative effort the formulation of a comprhensive overall plan will provide the framework for adequate recreation opportunities for all the people of our country—a program the people will approve and can, with confidence, seek public support for it.

The Montana Wildlife Federation wholeheartedly endorses S. 2549 and highly commends its sponsors.

That is my statement.

The CHAIRMAN. Thank you very much, Mr. Deckert.

Mr. W. J. Everin, director of the Montana Fish and Game Department.

## STATEMENT OF W. J. EVERIN, DIRECTOR, MONTANA FISH AND GAME DEPARTMENT

Mr. EVERIN. Mr. Chairman and members of the committee; the water resources of Montana are connected directly to one of the largest industries in Montana. Montana, with its many scenic areas and two national parks, has a million and a half visitors each year for recreational purposes. The Upper Missouri River Basin contains the most important trout-stream fishery in the United States. In preserving these natural trout fisheries for posterity, the habitat, including the stream system, should be protected. Such rivers as the Big Hole, Beaverhead, Jefferson, Gallatin, Madison, Missouri, and Yellowstone are nationally important for trout fishing. It is recognized by the Montana Fish and Game Commission, which is charged with the protection of fish and game resources of Montana, that economic development will in time materially affect the habitat of both fish and wildlife. Water-development projects will create certain types of recreation such as water skiing and boating; however, providing this type of recreation is not nearly as difficult as the preservation of the fast-decreasing natural type of wildlife recreation areas such as important trout-stream fisheries and high-quality hunting resources. Montana is one of the last strongholds of some of the finest big-game hunting and trout-stream fishing on the continent. These resources cannot be replaced. The Montana Fish and Game Commission urges that—

1. The decision to build individual projects be based on adequate evaluations of the impact on all resources, not just the possible gains in irrigation, power, and flood control. In other words, the effects of a project on such irreplaceable resources as fish and game should be thoroughly studied prior to authorization by the Congress. The approach should be to project the needs for fish and wildlife recreation to the year 2000 and beyond so as to predict whether or not losses to some of the finest trout-stream fishing and big-game hunting in the Nation can be afforded. These studies should include investigation of means to mitigate fish and wildlife losses. Only sites resulting in a minimum of loss to fish and wildlife should be authorized.

2. When power dams are built, means should be provided so a small portion of the power revenue (a fraction of a mill for each dollar revenue) will be allocated to cover the greatly increased cost of sport-fishing management caused by the impoundments. Such impoundments are most difficult to manage for sport fishing. The habitat is unfavorable for trout due to loss of spawning areas, et cetera, but favorable for nongame fish which soon overrun the water. Managing these waters for sport fishing creates a financial burden on the Montana Fish and Game Department beyond the moneys available from fishing licenses for this purpose.

The Montana Fish and Game Commission is opposed to the construction of water-control structures on nationally important trout streams because of the detrimental effects of these installations on both game and fish, and urges that adequate appraisal and study be made on the Missouri River Basin as outlined.

The CHAIRMAN. Thank you very much, Mr. Everin.

Mr. Willard Fraser, Billings Chamber of Commerce.

## STATEMENT OF WILLARD E. FRASER, BILLINGS CHAMBER OF COMMERCE

Mr. FRASER. Mr. Chairman, if it is all right with this committee, I will give a very brief summary and submit a report.

The CHAIRMAN. All right, sir.

(The report referred to follows:)

STATEMENT OF WILLARD E. FRASER, BILLINGS CHAMBER OF COMMERCE

Senators, the history of the West might be believed to have been written in blood, if one were to take his history lessons from the current TV westerns, but the actual truth of the matter is that western history was largely written in "water." This was true of our past history, and will be a thousand times truer of our future history. History is also replete with descriptions of civilizations that have perished for lack of water, and again history tells us that what has happened before can happen to us, and we in Montana are perilously close to seeing history repeat itself in our times, for the encroachment from the outside plus internal use of Montana's water resources is cause for alarm. That individual States have cause for apprehension, such as is Montana's case, is well pointed out in an editorial that appeared in the May issue of American Forests (copy attached). This editorial covers proposed legislation in the Congress to protect individual State's water rights, and in itself clearly stresses the seriousness of this problem. Time is too short to give too detailed a report on such encroachments, but here are some of the items that will illustrate what could happen to Montana's water resources.

The flow of the Missouri River must be maintained to sustain a flow of a 12-foot channel for navigation from Sioux Falls to Kansas City, and the various irrigation projects below the four new large storage dams of the two Dakotas. Bear in mind, Senators, that this also includes ground water, and we in Montana so far know so very little about our ground-water resources in Montana. The U.S. Geological Survey has recently completed the first complete survey of Montana's ground water in the Gallatin Valley, but as yet their report has not been made available to the citizens of our State; however, conversations with members of the survey field crews indicate that this is probably one of the greatest aquifers to be found in the West. As of now, Montana has made little—if indeed any—attempt to claim rights to this underground water. In the Madison Valley, this water is so close to the surface that vast areas can be irrigated by pump and sprinkler systems which, as the Senators well know, is the most economical way of placing new areas under prime irrigation. Land leveling is not required for sprinkler-type irrigation. Expensive to build, and to maintain, drainage ditches, which are also wasteful of water, are not required for this type of irrigation. In truth, it eliminates the waste that is to be found in all large irrigation projects due to seepage and drainage which can never be overcome to any great degree in major irrigation districts or areas. Many other important implications of this proposal could be discussed.

Montana has two representatives on the Columbia River Advisory Board, and that board recently met, planning for the year's program, and meeting with them was the Governor of Colorado. At that time the Governor of Colorado made an effort (I believe it was his first attempt) to arrange for a diversion of Columbia River water from that river into the Colorado River. One doubts, for it is hardly conceivable, that this water is destined for the use of Colorado, or its citizens; rather it is unquestionably to be used by Californians in California, for California—as the Senators know—now claims most of the water on the western slope of the Continental Divide in Colorado.

Obviously the Governor is attempting this program; so that the California claims can be eased off, and Colorado can then divert some of its own water to it's eastern slope and cities (such as the Denver area) where water is so badly needed, and already seriously threatening the future expansion of the area. Many diversions have already been accomplished in this State.

Wyoming stands as another example of how very difficult it is for individual States to prevent other, and out-of-State interests from acquiring rights to water of a particular State. Cheyenne and Laramie are two Wyoming cities with an acute water shortage problem. The Snowy Mountains to the west of these two cities contain an abundance of water, and indeed the little water that they now

have comes from these mountains, but they are deprived of any additional water at this time because it has all been allocated for irrigation purposes downstream mostly in another State—Nebraska—and the only way that they can obtain this badly needed additional water is to divert the water that flows from four miserably small mountain streams on the west side of the Continental Divide—and these four streams are in Colorado, some 50 miles north of Steamboat Springs, Colo. (For reasons unknown to the author, California did not lay claim to this particular area. Perhaps it did not show up on California's maps of the area.) If the two Wyoming cities—Cheyenne and Laramie—are to use this water, they must pick it up and divert it to the east side of the Continental Divide, where it will then flow into the River Platte. This, Nebraska, and its water users, have agreed will compensate for the water claims on this stream so that these two cities will then be permitted to use water from the Snowy Mountains of Wyoming for their use.

Montanans are not unaware of the threat of an attempt being made in the not too distant future to divert water of the eastern side of the Continental Divide into tributaries of the Columbia River, for admittedly there are numerous locations where such diversion could be made without too much cost or engineering difficulties being encountered. These threats are softly spoken now, but we know of the great demand for more and more power in the Columbia Basin, and as that demand grows; so will the voices increase calling for a diversion of our eastern Montana waters to the west. This especially worries we Montanans who live in or near the Yellowstone River drainage area.

As of now, Montana's claims for Montana waters that flow into the Columbia have never been given too serious consideration, simply because of the fact that lacking serious consideration, they have yet to be clearly defined. Generally speaking one might say that our State has been practically robbed of much of its potential waterpower except in a few instances such as the relatively small allotment of power that was made available at the Hungry Horse Dam for local industries lying within a 50-mile radius of that great dam, and the water rights that have been been established by the Montana Power Co. at the lower end of Flathead Lake and at Thompson Falls. I might point out, Senators, that with the two exceptions—Kerr Dam and Thompson Falls—all the others are outside of our State of Montana. This is in addition to the power that is actually generated at Hungry Horse Dam. At this point, Senators, I would like to point out a fact and factor that few people realize, and that is that the water that is stored behind the great Hunry Horse Dam has actually increased by some 45 percent the capacity of the dams downstream from that project. This is true because of the terrific storage capacity of Hungry Horse, which can be released during low water periods at the lower Columbia River regions, an emergency situation can and does occur in midwinter as well as in a dry summer season. I might also, at this point, mention that the tax valuation of Flathead County, which is the Montana county within which Hungry Horse Dam was built was roughly $35 million at the time the construction of this dam was started, and only 10 years later—when the dam had been completed and the power generators in operation, the tax valuation of Flathead County had increased to nearly $85 million according to figures in my files obtained from the Montana Board of Equalization.

Thus Senators, it can clearly be seen why we of the Yellowstone River drainage area are deeply and gravely concerned over the future of the waters of this great drainage. The Yellowstone River and its tributaries are at this late date almost alone in having been permitted to continue to flow uninterruptedly out of Montana without contributing to Montana—and the Nation's wealth. We are concerned at the covetous eyes already viewing the wealth that these waters can bring to downstate peoples. For this reason we were justly distressed at the failure of the last, and other Congresses, to vote the construction of the Yellowtail Dam. We know that it is a law of nature that water will always flow downhill, and we in Montana cannot prevent, nor do we want to prevent our waters flowing wealth into our neighboring States, but we ask your help in assisting us to utilize to the maximum, these waters of the Yellowstone through the immediate construction of such storage dams as the Yellowtail project now that we may utilize its flow before the waters continue their passage on to join the Missouri and Mississippi River.

In conclusion, let me point out that a few years ago when the Gulf States were experiencing their great drought, and the salt waters were encroaching as the fresh water streams were drought dried, the water intake of the city of New Orleans was seriously threatened by the advancing salt waters. A call, in effect, was hastily made to Fort Peck, Mont., for help. Immediately on

receipt of that cry for aid, the stored up waters of the Montana's Missouri River at Fort Peck were released. Three weeks later when this water reached New Orleans, the salt water had advanced to within less than two blocks of the New Orleans city water intake, but was successfully pushed back into the Gulf of Mexico by Montana-stored water. Competent authorities have told the writer that had the salt water had its way with the New Orleans water system, it would have wrecked havoc the repair of which would probably have cost many millions of dollars. Fort Peck Dam, by retaining floodwaters also saved St. Joseph and other Missouri communities from great flood damage during the devastating floods of that region a few years ago. Thus it can be seen that waters retained upstream by large dams pay their freight, not only to the locality in which they are built, but to the neighboring State, and the whole economy.

[Editorial]

NATIONAL FORESTS USE: PRIVILEGE OR RIGHT

In the opinion of some AFA members, the Forest Service made an error in judgment when it gave the nod to inclusion of a clause recognizing sustained yield and multiple use in the wilderness bill. This move was precipitated during the scrap over the disposition of the Klamath Indian timber when certain proposals by the lumber industry were interpreted to mean it might be attempting to weaken present provisions in the Secretary's regulations governing allowable cut on the forests. Sustained yield, being a comparatively new development in forestry, is not recognized as such in the organic act creating the national forests, although it is covered in the Secretary's regulations.

While strong for sustained yield and multiple use, some AFA members believe that the present provisions covering the forests are sufficiently broad and that the Service's move could be interpreted to mean it is fearful present regulations don't have sufficient teeth to meet mounting pressures. To go one step further, the move could be interpreted to mean the Service has been operating illegally on the forests for a number of decades. This we do not believe and moreover, the public, which has always supported national forest programs, is not likely to believe it either. The strength of the forests rests primarily on the will of the American people. The people believe in these forests and they believe in Forest Service programs. No artful dodges by special groups in interpretation of broad powers given to the Service are likely to alter the status quo in this respect.

Even more serious in the opinion of some is that in giving the nod to insertion of the clause in the bill, the Service indicated its willingness to play ball, despite its reservations, with a bill it has absolutely no right to support in its present form if it intends to stick by its multiple use guns and fairly represent all the American people. Here is a bill that grants special legislative privileges to a special kind of use in perpetuity. Here is a bill that proposes a built-in lobby to be supported by the taxpayers in the form of a Wilderness Council. Hard battles have been fought over this issue in the past. The record shows that AFA has emerged triumphant from more than one battle with the stockmen after upholding the principle that use of the forests is a privilege, not a right. The fact that the present attempt is being waged by a different type of special interests composed of unselfish, idealistic people does not alter the issue in the slightest degree. That issue, once again, is whether use of the national forests shall continue to be a privilege or a right.

What does AFA's Board say about it? In its resolution of July 1956, the board said in part, "* * * Obtaining the maximum of economic and social services, i.e., the greatest good for the greatest number in the long run, requires that multiple uses must be considered. The relationship of these uses to one another and to the overall welfare of the Nation has to be determined by those concerned. The present generation must evaluate present priorities with due regard for the best interests of future generations. But the present generation cannot deny its descendants the right to use all inherited resources for fulfillment and protection of their own needs. To do so defeats the basic concept of multiple use."

Multiple-use management by trained administrators or single use by legislative fiat: That is the choice. In playing on the harp of public opinion, proponents of the bill have developed a sense of urgency, a sense of imminent loss of wilderness areas, when the fact is we have more wilderness areas on national forests today than ever before. Honest people are being "conned" into the be-

lief that unless we lock up these wilderness areas for keeps, "all will be lost"—a philosophy enunciated by individuals who have apparently developed a deep-seated mistrust of scientific management on national forests.

Certainly multiple use—the art of managing forests, water, soil, wildlife, and recreation for the greatest good of the greatest number in the long run—is being challenged today as it has never been challenged before. Even as AFA leaders look hopefully to Congress to reject this unwise bill, a new study in New Mexico, liberally supported by stockmen, is apparently being readied for a last-ditch attempt to redeem the public lands plank stockmen inserted in President Eisenhower's first platform. This modest proposal would turn over upward of 200 million acres of public domain grazing lands to the States, making sure that sale of individual tracts would give priority to present users—single use any way you slice it, and a land grab to boot. Out in California the Sierra Club, which supports the wilderness bill, also supports a move to turn the bulk of national forest wilderness areas over to Interior—a move that in our opinion would not prolong their longevity as wilderness areas compared to management under the national forests banner, but which would still be preferable to the wilderness bill if a choice had to be made. But here again, another single use gambit.

Up to now the Forest Service has been extending the velvet glove of conciliation to these various proposals, but individual Americans who own their own share of stock in these lands may soon start wondering why their trustees on the lands don't begin defending their interests in more vigorous terms. Looking back over 50 years of history, AFA finds that the public, in the final analysis, has always ruled that these forests belong to all of us and not to any one clique. To spell out in letters of fire that use of these forests is a privilege and not a right, we believe the time may well be at hand to call a fifth forest congress to rededicate ourselves to basic principles in which we believe and to keep faith with those who have gone before.

We have come too far in 50 years in developing scientific management of our forests, soil, water, wildlife, and recreation resources to risk upsetting a good pattern of management now. To continue that pattern the integrity of the national forests must be preserved.

Mr. FRASER. The chamber asked me to commend the Senate committee and the Senate for making this study of this great water problem.

We of the Yellowstone River drainage area are deeply and gravely concerned over the future of the waters of this great drainage. The Yellowstone River and its tributaries are at this late date almost alone in having been permitted to continue to flow uninterruptedly out of Montana without contributing to Montana—and the Nation's wealth. We are concerned at the covetous eyes already viewing the wealth that these waters can bring to downstate peoples. For this reason, we were justly distressed at the failure of the last and other Congresses to vote the construction of the Yellowtail Dam. We know that it is a law of nature that water will always flow downhill, and we in Montana cannot prevent, nor do we want to prevent, our waters flowing wealth into our neighboring States, but we ask your help in assisting us to utilize to the maximum these waters of the Yellowstone through the immediate construction of such storage dams as the Yellowtail project now that we may utilize the flow before the waters continue their passage on to join the Missouri and Mississippi Rivers.

The rest of the statement I would like to submit.

The CHAIRMAN. Thank you very much, Mr. Fraser.

That concludes the list of witnesses that have been presented to this committee. If there are others with statements, they may be inserted in the record.

That concludes the hearing for today.

(Whereupon, at 3:40 p.m. Friday, October 9, 1959, the hearing was adjourned.)

# WATER RESOURCES

MONDAY, OCTOBER 12, 1959

U.S. SENATE,
SELECT COMMITTEE ON NATIONAL WATER RESOURCES,
*Missoula, Mont.*

The select committee met at 9 a.m., pursuant to Senate Resolution 48, in the University Theater, Montana State University, Missoula, Mont.

Present: Senators Kerr (presiding), Murray, and Young.

Also present: Representative Metcalf.

Theodore M. Schad, staff director of the select committee, and Paul McBride, chief clerk.

The CHAIRMAN. I am glad to have the opportunity to have this hearing in Missoula, the second one that we have had in your fair State of Montana.

I am honored to be here with your distinguished and respected senior Senator.

In my judgment Montana is about as well represented in the U.S. Senate as any State in the Union. Senator Murray, chairman of the important Interior and Insular Affairs Committee, and Senator Mansfield, the assistant to the Majority Leader of the Senate are men with great ability and dedication to the development of the State. They were the two sponsors of the resolution that brought about the creation of this committee, which is doing its work in the belief that a more aggressive program of conservation and utilization of water is one of the most important economic developments ahead of us.

It has taken our country 352 years to become a Nation of 178 million people. Technical experts and forecasters in the Census Bureau tell us that that population would double by the year 2000. I think it is now apparent that the Nation's gross national production will be at the rate of $500 million per year as we go out of 1959. Industrial engineers forecast that that will double in 15 or 20 years.

These amazing and astounding developments must be based on the intelligent and effective use of our water resources. Growing population and growing production can only be achieved consistently with the development of water resources at a rate such as to permit these tremendous increases in agricultural production and industrial production to take place.

I know of no State in a better position to benefit by both than Montana. The industrial workshops of the future will be in the areas where there is available usable water, low-cost energy fuel, and an alert, aggressive population to conserve and utilize them.

It is our hope that out of our hearings, deliberations, and investigations will come a blueprint showing where additional water is available, how additional uses of water to increase its value may be developed, what the needs of our people will be in the decades immediately ahead, and where those needs can be best met and how.

Senator Murray, I am sure you have a statement for us and then I know that you have some fine witnesses here that we are going to be glad to listen to so I am happy at this time to call on Senator Murray for those purposes.

## STATEMENT BY HON. JAMES E. MURRAY, U.S. SENATOR FROM THE STATE OF MONTANA

Senator MURRAY. Thank you, Senator Kerr, for your very fine statements. I am sure that all of us in Montana who have been following this problem are in full accord with your observation with reference to the importance of this study that we are making and the program that we are going to make an effort to carry out. Without it Montana would be in a very critical condition. It seems to me that this is one of the most important matters for our State to pay attention to.

We are all indebted to Senator Kerr and the members of the Senate Select Committee on National Water Resources who have come to Montana for 2 days of hearings on our water problems. There were hearings Friday in Billings. The committee will go on to Boise, Idaho, this evening at the close of this second Montana hearing.

As I said in Billings, it is a special pleasure to have the chairman of this committee, Senator Robert S. Kerr, with us. He is a builder—and an aggressive, hard-working one. He believes in abundance. As Governor of Oklahoma, he developed a long-term plan for water resources development in his State and he has been pushing it through, project by project, ever since.

Bob Kerr knows the folly of a "no new starts" policy. He knows we must develop our resources and our productive capacity all over this Nation or we will stagnate, endure hard times and become a second-rate world power. He knows that we cannot cease building dams, cut back our soil and forest and mineral programs and otherwise pinch pennies without serious economic consequences for local areas and the whole Nation.

I believe that all of the members of this select committee share that view and when this committee has determined national water needs in the years ahead, its members will join in putting through Congress the necessary Federal programs to meet those needs.

The population of our Nation is constantly increasing. Our demands on resources are increasing even more rapidly as our standards of living rise. We have abundant resources to meet increasing requirements if we will make the necessary investments for their development, conservation, and wise use. This committee is undertaking to determine how we meet our requirements presently, and 25 to 50 years in the future. We are now using about 240 billion gallons of water in the Nation daily. Authorities agree we will be using 350 billion gallons a day by 1975. There is not now under construction or planned for construction the water resources projects necessary to meet such increased requirements.

It is the task of this committee to develop programs to meet these growing water needs, and I am sure that they will recommend progressive measures—not a no-new-starts program which would entail restrictions on use of water rather than developments assuring adequate supplies.

Unlike those who would halt progress to avoid investing a few dollars in new facilities, the members of this committee are exponents of modern plumbing.

Our Nation, like a private business institution, can have an expanding economy, prosperity, and abundance if it uses its resources wisely and invests wisely in programs which will preserve, conserve, and develop them for their best use.

This select committee study of water resources will help to develop a basis for wise planning, and wise action by the various committees of Congress on water projects.

Near the close of the last session of Congress, I was joined by 30 of my colleagues in introducing the Resources and Conservation Act of 1960, which we hope to pass next year. It would establish a continuing council of resources and conservation advisers in the executive department and a continuing joint committee of Congress. These agencies would constantly study and review all of our resources fields, keeping the work of this committee and other committees, commissions, and executive agencies on water, minerals, recreation resources, fuel, timber, land, and other resources up to date. The Resources and Conservation Act provides for an annual report to Congress and the people of the Nation showing where we stand on programs to assure adequate resources.

In my opinion, this Nation has no more important work than to plan intelligently for abundance in the future and avoid the waste and destruction of resources which has brought downfall to other great countries in the past.

I have a statement here for the record from Leon C. Hurtt of Grasshaven Ranches, near Billings, and one from Mrs. Grace Bates of Bozeman. These statements will be carried in the record.

(The statements referred to follows:)

STATEMENT OF LEON C. HURTT, PRESIDENT, GRASSHAVEN RANCHES, BILLINGS, MONT.

I am Leon C. Hurtt, retired 8 years ago after 38 years with the U.S. Forest Service, devoted mainly to range and watershed management work. I am part owner and operator of a sizable Montana cattle ranch, but live in Missoula.

The headwaters of the Missouri and Columbia basins embrace some 90 million acres of mostly semiarid land in Montana that is subject to frequent drought years. This water is one of our most vital resources, but only a small fraction of its potential benefits have been developed. Because of our remoteness from major markets, high transportation rates, and other obstacles, our economy is under a tremendous handicap. Until our vast waterpower is more fully developed, Montana will remain a hinterland with a semicolonial economy in need of industrial, irrigation, and recreation development. Montana has lagged behind other States in rate of population growth in recent years. Industrial developments have recently increased, but are not yet undergirded by adequate basic watershed research. This situation can and must be corrected. As one example, Montana has millions of tons of raw rock phosphate that could, with cheap hydro power, be converted to much needed fertilizer, plus hundreds of other industrial products, and also furnish thousands of new jobs.

A sharply increased program of watershed research is now specifically needed for the upper Missouri and Columbia basins to harmonize management practices on forest, range, and crop lands with a comprehensive but sound program of water storage and management integrated with multiple use of related resources. In Montana such research has lagged behind other States, but the need here is now pressing. This is a field of complex relationships, but methods and know-how are now well developed to start a well-planned watershed research program. One of the most effective and cheapest regulators of streamflow and floods is proper management of vegetation and the soil mantle of each drainage. The urgent need now is to provide the funds required to get on with a sound, comprehensive plan of development for the upper Columbia and Missouri Rivers.

The notion that hundreds of small, single-purpose headwater dams alone would provide adequate water development in the upper Columbia and Missouri basins is a dangerous fallacy. It lacks commonsense and violates the principle of complete river development expressed by Theodore Roosevelt half a century ago and confirmed by competent engineering authorities over the years. A small-dam program would block full development of our rivers for power, flood control, recreation, irrigation, navigation, and other constructive uses, and keep Montana a semicolonial economy.

Small dams just won't do the job. This conclusion is based on my analysis of some 300 existing small dams in Montana as reported to the Army Corps of Engineers hearings in Missoula October 21, 1957, on the proposed Paradise Dam.

---

STATEMENT OF GRACE BATES, VICE CHAIRMAN, MONTANA DEMOCRATIC CENTRAL COMMITTEE, NATURAL RESOURCES HEARING, MISSOULA, MONT.

Faster development of Montana's natural resources is essential for the expansion of Montana's economic growth. We want to keep Montana girls and boys in Montana; only by an increased economy will we be able to do so. With the rapid development of Montana's natural resources—water, timber, mineral, scenic, and others—Montana can and will be a more prosperous and populous State.

Following quote from the Montana 1958 Democratic platform:

"We believe natural resources belong to the people and must be managed in the public interest.

"We believe in the principle of multiple-purpose uses and we will continue to work for sound, progressive, and comprehensive management and development of the land and water resources of our State and Nation in order to get the maximum flood control, irrigation and reclamation, power, forest production, grazing, fish and wildlife conservation, and recreation."

GRACE BATES.

Senator MURRAY. Congressman Metcalf has a brief statement he would like to make. So I will call on Congressman Metcalf now.

The CHAIRMAN. Congressman, we are glad to have you here.

We remember with pleasure our association with you a number of years ago. We congratulate the people of your district upon their good judgment in sending you to Washington to represent them and the fine job you have done there. We are happy to have your statement.

## STATEMENT OF HON. LEE METCALF, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MONTANA

Representative METCALF. Senator Kerr, that is very kind of you.

As a Representative of this district, I welcome you, your committee and your staff to Missoula. The people of Montana, and the people of Butte and Helena and Kalispell especially remember with a great deal of pleasure your previous visit to Montana, and I am glad you are in another town in my district.

The CHAIRMAN. Tell me, Congressman, is it a fact that Missoula means land of sparkling waters?

Representative METCALF. It certainly is a land of sparkling waters today.

The CHAIRMAN. Is that the meaning of that word? I have been told that it was.

Representative METCALF. I am not sure of what the meaning is.

The CHAIRMAN. Let's look that up. If it was, I think, it might be all right. I know it is not Choctaw or Cherokee.

Representative METCALF. But it is good Flathead or Blackfeet.

The CHAIRMAN. All right.

Representative METCALF. Mr. Chairman, it is appropriate that your committee, the Senate Select Committee on National Resources, has selected this area, the western district of Montana, for one of its early hearings, for the congressional district that you are visiting today is one of the most important areas in the United States for national water resources development. You heard in Billings how 70 percent of the water of the Missouri River rose in Montana at the flow of the river from Montana in the Yellowstone and the Missouri main stream. The headwaters of the Missouri River are located in this, my congressional district. In addition, the headwaters of many of the most important tributaries of the Columbia River are in this district. More than twice as much water flows into the Columbia system as flows from Montana into the Missouri system. So this congressional district affects water resources policy from Portland and the mouth of the Columbia to the Gulf of Mexico.

What we do with water here on this continental slope is important to everybody in many, many States in the Missouri, Mississippi, Columbia region.

Montana water is busy water. In our hydroelectric power storage projects here in Montana, water is used over and over again, in the dams downstream. Montana's water is committed to multiple use in Montana. We have a long history of irrigation in this State. On the map before you, in the Helena Valley where I was born, is one of the earliest irrigation projects in Montana, a non-Federal project that has of late years had to have some Federal assistance.

Montana recreational facilities are internationally famous but they are dependent upon conservation and wise use and development of our water resources.

Montana's water and our storage facilities are essential to downstream navigation and our storage protects our neighbors downstream from floods in the spring, from brown-outs and water shortages in the fall and winter.

My friends and constituents, the witnesses who are to follow me, are going to discuss all of these matters in great detail. They are men and women of wide experience and knowledge of our water problems. You will hear differing points of view this morning, widely different opinions. But the personal experiences of these witnesses will bring about a pattern that will help you in your efforts to evolve a national water resources policy.

I have pointed out that Montana is upstream from everywhere. Because of our geographical position, I especially want to remind you that if upstream States are to be used for storage of water for

their own benefit and for the benefit of their downstream neighbors, it is only just and equitable that the loss of agricultural land and tax revenue be compensated for. The most workable technique that has been evolved is the formula that was brought about at Hungry Horse Dam, where a block of power at the site was reserved for use in the State of Montana. As a result of that reservation of at-site power in the State of Montana we have a new industry in Montana, the Anaconda Aluminum Co. at Columbia Falls.

Our Montana congressional delegation and Senator Murray, Senator Mansfield, will confirm this: Our insistence that in any future storage projects in Montana such as at-site power reservation for the industrial development of this State be a part of any authorizing agent.

I recommend to you in your search for the blueprint you mentioned for national water resources policy that you look into this Hungry Horse formula and provide for such an at-site power reservation for all upstream storage in upstream States as a matter of common equity and justice.

I appreciate this opportunity, Mr. Chairman, to appear before this committee and ask leave to submit a more detailed statement for the record.

As a concluding part of my statement, I ask permission to read into the record a letter from the distinguished junior Senator from Montana, Senator Mansfield, addressed to Senator Murray.

The letter says:

DEAR SENATOR: You and the distinguished Senator from Oklahoma, Robert S. Kerr, chairman of the Select Committee on National Water Resources, are to be complimented for your expeditious action in seeking to implement the purposes of Senate Resolution 48 which I had the pleasure of cosponsoring with you in your capacity as chairman of the Senate Committee on Interior and Insular Affairs. I am especially pleased that you are taking an active part in these hearings because of your reputation as one of the Nation's leading exponents of the development of our natural resources and in view of your vast knowledge of the progress as well as the deficiencies that exist in our national water resource programs. The water problems of this Nation are constantly increasing. It is a resource bordering on scarcity. The assurance of a continued supply of water is vital to human needs, conservation, sanitation, industrialization, hydroelectric power generation, recreation, flood control, and purification of our rivers and streams to name only a few. It is my hope that these field hearings will make a major contribution to the formulation of a national program which will meet the water needs of this country. As you know my views were expressed in more detail at the Billings hearing. I regret, because of previous commitments affecting Montana's interests, that I cannot participate in this hearing on the campus of my alma mater, Montana State University, but I would appreciate your extending my very best personal wishes to all of my Senate colleagues and the many Montanans who are in attendance at this hearing.

With best personal wishes, I am,

Sincerely yours,

MIKE MANSFIELD.

Representative METCALF. Again I welcome you and your committee, Mr. Chairman, and appreciate the opportunity to appear.

The CHAIRMAN. Thank you very much, Congressman Metcalf.

Senator MURRAY. The first witness on the agenda this morning is Gen. Allen F. Clark, division engineer, Corps of Army Engineers.

General Clark.

## STATEMENT OF BRIG. GEN. ALLEN F. CLARK, JR., DIVISION ENGINEER, U.S. ARMY ENGINEER DIVISION, NORTH PACIFIC

General CLARK. Thank you, Senator.

The CHAIRMAN. Good morning, General.

General CLARK. Good morning, sir.

I represent here, at the request of Senator Murray, the Chief of Engineers and also not only my own division, which is the North Pacific Division, covering the Columbia Basin, but I am speaking also on behalf of the Missouri River Basin and Missouri River division in Omaha.

I have, sir, a short statement and some more detailed material to be added to the record, with your permission, sir.

Sir, the Corps of Engineers, U.S. Army, is assigned Federal responsibility for the control, regulation and improvement of the water resources of the Nation, primarily in the fields of navigation and flood control. This responsibility includes the investigation of projects and planning, construction, and operation of facilities. Many of the projects of the corps, while concerned with flood control and navigation, involve multiple-purpose uses so that the corps is involved in hydroelectric power generation, irrigation, recreation, fish and wildlife, and other water resource fields.

The authorities under which the corps operates are many and complex. I am sure that the committee is fully cognizant of those authorities and I will not attempt to review or outline them at this time.

The broadest responsibilities of the corps in the water resource field grow out of the series of directives of the Congress to undertake comprehensive studies of the various river basins of the Nation. In the preparation of these studies, we coordinate our work closely with the Federal and State agencies which have water resource responsibilities. My office, the North Pacific Division, presented the latest revision of the comprehensive plan for the Columbia Basin in 1958; and the Missouri River division with headquarters in Omaha, Nebr., whom I also represent here today, have prepared and presented a similar comprehensive plan for the Missouri River, authorized by the Flood Control Act of 1944.

I would like to echo, Mr. Chairman, the statements of Congressman Metcalf with regard to the unique position which Montana occupies as the upper basin, the headwater State of two of the greatest river systems in the Nation, the Columbia and the Missouri. The water use and development in the State of Montana is not only of importance to the State of Montana, but has a direct bearing upon the development and the use of the water resources for the two great basins involved and of the Nation as a whole, and Montana is unique from that point of view.

Specifically in Montana, the Corps of Engineers has built or has under study a number of projects. Completed is Fort Peck Dam (presently being enlarged by the addition of a second powerhouse) and flood protection works for the towns of Glasgow, Havre, Saco on the Milk River, Forsyth on the Yellowstone River and navigation improvement at Polson Bay on Flathead Lake. Authorized projects, not yet constructed, include Libby Dam on the Kootenai River, flood protection works at Billings and Miles City on the Yellowstone River,

and at Great Falls at the junction of the Sun and Missouri Rivers. Under investigation, but not yet authorized, are projects for further protection of Glasgow, and for the feasibility of providing flood protection along the Sun River and its tributaries. Surveys have been directed on flood problems along the Jefferson, Madison, Gallatin, and Flathead Rivers but have not yet been funded. Also, the recent comprehensive review investigation of the Columbia River Basin, which I mentioned previously, was completed by the North Pacific Division and recommended four major projects in Montana:

Knowles Dam on the Flathead River, improvement of Flathead Lake outlet on the same river, Long Meadows Dam on the Yaak River, and a Bureau of Reclamation project, Ninemile Prairie Dam, on the Blackfoot River, as part of the long-range development plan for the Columbia Basin. This report is currently being reviewed by the Chief of Engineers and has not yet been submitted to the Congress. Finally, under the general authorities available to the corps, a number of small flood control projects have been completed and others are under study in the State. Detailed data on all of these projects, including estimated costs and benefits, are shown in this memorandum which I will submit for the record.

The CHAIRMAN. Very good.

Senator MURRAY. It will be carried in the record.

General CLARK. Thank you, sir.

(The information referred to follows:)

REPORT ON THE WATER RESOURCE PROGRAM OF THE CORPS OF ENGINEERS IN THE STATE OF MONTANA

Water resource activities of the Corps of Engineers in the State of Montana have been and are continuing to be directed toward maximum practicable development of the potentialities of its rivers and streams in the interest of flood control, navigation, water supply, hydroelectric power, and related purposes. These activities have culminated in the development of comprehensive plans of improvement for the Columbia and Missouri River Basins with key projects located in Montana. Studies directed toward the more complete development of these important water resources are currently in progress.

The comprehensive plan for improvement of the Missouri River Basin, authorized by the Flood Control Act of 1944, includes a major feature for control of upper Missouri River flows consisting of a system of six reservoirs with a total capacity of over 73 million acre-feet. Fort Peck Dam and Reservoir, the first of the reservoirs to be constructed, was initiated in 1933, and placed in operation in 1938. Its authorized primary purposes are flood control, navigation, irrigation, and power. It is the largest hydraulic earthfill dam in the world, and is about 4 miles long and 250 feet high. At full capacity the reservoir will store 19,412,000 acre-feet of water. Storage at present is about 11 million acre-feet.

The reservoir is operated as a part of the Missouri River main stem reservoir system which includes the now essentially completed Garrison, Fort Randall, and Gavins Point Reservoirs in North and South Dakota, Oahe Dam, under construction near Pierre, and Big Bend Dam to be built in South Dakota. System operation is determined in advance each year by a coordinating committee on which are represented 9 of the 10 Missouri Basin States and 7 Federal agencies. Actual day-by-day operation is carried out by the Reservoir Control Center in the corps' Missouri River division office in Omaha.

Power installation at Fort Peck at present includes two 35,000 kilowatt and one 15,000-kilowatt generators, and a second powerplant, which will add 80,000 kilowatts of generating capacity, is scheduled for completion by the end of December 1961. Recreation improvements, including access roads, water supply and sanitary installations, shelters, and boating, picnicking, and camping facilities, attract some 100,000 visitors annually.

The total estimated cost of the project is $160,200,000, and average annual benefits are estimated at $10,763,200. Benefits accrued to date for flood control alone are estimated to exceed $100 million.

Other completed works in Montana include flood protection for the towns of Glasgow, Havre, and Saco along the Milk River and for the town of Forsyth along the Yellowstone River and navigation improvement at Polson Bay on Flathead Lake.

A levee project to protect Glasgow against floods on the Milk River and its tributary Cherry Creek was built by the corps in 1938 at a Federal cost of $16,830. The levee extends 12,325 feet along the left bank of the two streams. Benefits accrued to date are estimated at more than 20 times the investment cost.

The Havre local flood protection project consists of two units built by the corps; the Bull Hook unit, completed in 1956, and the Milk River unit, completed in 1957. The Bull Hook unit prevents flood damages in Havre from Bull Hook Creek and Scott Coulee by means of two diversion dams and appurtenant channels. The Milk River unit consists essentially of some 15,430 feet of levee on the south bank and 5,150 feet of levee on the north bank of the Milk River. Extensive business, residential, and industrial areas in the city are protected by the two units which are being operated and maintained by local interests. The Federal cost of the overall project was $1,845,000, including preauthorization planning costs. Average annual benefits are estimated at $275,600 based on 1957 price levels.

A levee project for protection of Saco against floods on Beaver Creek, a tributary of the Milk River, was completed by the corps and turned over to local interests for operation and maintenance in 1957. Federal cost of the project was $74,000 including preauthorization planning costs, and average annual benefits are estimated at $17,100.

A flood protection project at Forsyth, completed by the corps in 1948, protects highly developed business, residential, and industrial areas against Yellowstone River floods of up to 140,000 cubic feet per second. Project features include a 12,974-foot earth levee, a concrete retaining wall, and a concrete floodwall. Federal cost of construction was $255,200, and estimated average annual benefits, based on 1948 price levels, amount to $18,900.

A project involving flood protection works along the Shields River at the U.S. Highway 89 crossing near Clydepark was completed in 1950 at a Federal cost of $25,750. Average annual benefits from the project are estimated at $5,700.

A flood protection project involving levees and a diversion channel is under construction on the left bank of the Yellowstone River at West Glendive. Estimated Federal cost of the project is $234,400, and the average annual benefits are expected to amount to $19,000.

At Polson Bay, a navigation channel improvement project provides an outlet for long traffic which has contributed materially to the encouragement of the lumber industry in the Flathead Lake area.

In addition to the above, numerous bank protection, snagging and clearing, and levee repair projects have been provided over the years under the special continuing authorities enacted by Congress. Total cost of these emergency-type projects is in excess of $2 million. The most notable operation of this type is currently underway on the Madison River below Hebgen Reservoir where an imminent flood threat to the valley below is being eased by construction of a spillway over the earthquake-caused slide. Estimated total cost of this operation is in excess of $1,500,000.

Authorized work in the State of Montana includes the Libby Dam on the Kootenai River and local flood protection work at the towns of Billings and Miles City on the Yellowstone River and at the town of Great Falls at the junction of the Sun and Missouri Rivers.

The proposed Libby project was authorized by the 1950 Flood Control Act as a unit in the Corps of Engineers' comprehensive plan for development of the water resources of the Columbia River Basin. The main structure, located about 15 miles east and upstream from the town of Libby, will be a concrete gravity dam about 400 feet high and 2,700 long at the crest. Each of the 4 initial and 8 ultimate main generators will have a capacity of 86,000 kilowatts and the reservoir at full pool elevation will provide 5,010,000 acre-feet of usable storage capacity. The project would control floods along the Kootenai River and would be a key element in the control of floods along the lower Columbia River. In

addition, the project would produce at-site and downstream power benefits and would provide benefits to navigation and recreation. The Libby project, as presently authorized, would back water 42 miles into Canada. Under the Boundary Waters Treaty of 1909, the development of the project is contingent upon approval by the International Joint Commission, United States and Canada. The Government of the United States applied to the Commission for such approval in 1954 but action by the Commission on the application has been delayed pending completion of studies initiated by the Government of Canada.

An authorized project for protection of Billings against floods originating on the Yellowstone River and six small tributary streams in the vicinity is divided into three units, the western, eastern, and southern units. Flood control will be accomplished by means of channel improvements, diversion, and levees. Estimated Federal cost of the overall improvement is $4,460,000 including preauthorization study costs, and estimated average annual benefits amount to $379,200. Some preconstruction planning has been accomplished, but was discontinued pending receipt of formal assurances that the requirements of local cooperation will be fulfilled.

A project for protection of Miles City against floods on the Yellowstone and Tongue Rivers was authorized in 1950. The plan involves 1,330 feet of riprap along the right bank of the Yellowstone, and 27,550 feet of levee along the right bank of both rivers. Another 8,600 feet of levee along the left bank of Tongue River will be built when economically justified by development of the contiguous area. The project, at an estimated Federal cost of $1,600,000, will protect the city against all floods on the two rivers, earning average annual benefits estimated at $76,000. No funds have been appropriated for detailed planning or construction.

A levee and channel reactification project for Great Falls was authorized in 1958. The project will protect against floods on the Sun and Missouri Rivers at an estimated Federal cost of $1,830,000 including preauthorization study costs. Average annual benefits are estimated at $131,700, based on 1959 price levels. No funds have been appropriated for detailed planning or construction.

In addition to this work, local protection along the Clark Fork at Missoula and along the St. Regis River were authorized by the Flood Control Act of 1950, subject to a prior determination of economic feasibility.

An important, but probably less known, phase of Corps of Engineers activities in the State of Montana is its program of water resource investigations conducted through examinations and surveys of the rivers of the State. A survey report recommending additional protection for Gasgow against floods from adjacent benchlands by diversion of runoff from coulees and draws at a total estimated cost of $278,800, has been submitted to Congress. A survey to determine the feasibility of providing flood protection along the Sun River and its tributaries has been authorized by Congress and is currently in progress. A survey to determine if any modification in the recommendations of a previous report on the Jefferson, Madison, and Gallatin Rivers concerning flood control and allied improvements is now warranted has been authorized, but field investigation has been deferred pending allotment of funds. Along the Flathead River, a survey to determine the feasibility of providing protection from floods in the vicinity of Kalispell has been authorized, but work on the report has been deferred pending allotment of funds.

A comprehensive review investigation of Columbia River was authorized by Congress in 1955 requesting the Corps of Engineers to review the previous findings of House Document 531–81–2, with the view to determining the advisability of modifying the existing project in any way, particularly with regard to present requirements of flood control including consideration of flood storage in Canada; the present needs of navigation; a restudy of hydroelectric power potentialities as part of a combined hydrothermal system; and consideration of all related water uses. The report of the division engineer, North Pacific Division, in response to this request, was submitted to the Chief of Engineers in June 1958. This report, comprehensive in scope, is directly primarily toward reestablishment of a plan to solve major problems of main stem flood control

and navigation and providing a basic plan of power development in the Pacific Northwest. Recommended projects in the State of Montana are:

| Project | River | Description | Estimated cost |
|---|---|---|---|
| Knowles | Flathead River | Dam and reservoir | $234,910,000 |
| Long Meadows | Yaak River | do | 25,709,000 |
| Flathead Lake outlet | Flathead River | Channel improvement | 6,142,000 |

Also included in the recommendation was the Ninemile Prairie project on the Blackfoot River, as planned and proposed by the Bureau of Reclamation at an estimated cost of $54,893,000.

The Division Engineer's comprehensive report on the Columbia River Basin is currently being reviewed by the Office, Chief of Engineers, prior to its submission to Congress in the not too distant future.

The CHAIRMAN. Do you have any questions, Senator?

Senator MURRAY. I have no questions.

The CHAIRMAN. I wanted to ask a question or two.

General CLARK. Yes, sir.

The CHAIRMAN. Flathead Lake is something which both the Corps and Bureau can point to with a good deal of interest but not pride.

General CLARK. We point to it with some pride, sir, in navigation.

The CHAIRMAN. It is neither a Corps nor Bureau project?

General CLARK. No, sir; it was not made by us.

The CHAIRMAN. What is the size of it?

General CLARK. Sir, just offhand, it is on the order of 30 or 40 miles long and 5 to 10 miles wide. It is a big lake. I could get you details on square mileage if you like, sir.

The CHAIRMAN. Its average depth?

General CLARK. I think I would have to——

The CHAIRMAN. Could you put that statement in the record, the amount of water in it?

General CLARK. Yes, sir.

The CHAIRMAN. Do you know the amount of water in any of the lakes the corps built?

General CLARK. Yes, sir.

The CHAIRMAN. And the Bureau knows the amount of water in any lakes they built?

General CLARK. I presume so, sir.

The CHAIRMAN. East of the Continental Divide the principal flowage of water out of Montana, as I understand it, is in the Missouri and the Yellowstone Rivers, maybe a little of it in the Little Missouri River?

General CLARK. Yes, sir; I believe that is correct.

The CHAIRMAN. Is there any other stream carrying substantial amounts of water out of Montana to the east?

General CLARK. Sir, I believe not a substantial amount. There is a divide in the north and north-central part of Montana where some water drains up into Hudson Bay. But I don't believe you would call it substantial.

The CHAIRMAN. Insofar as our country is concerned, the rivers or utlets I have mentioned constitute about the entire list?

General CLARK. Yes, sir; that is the major part of it.

The CHAIRMAN. Now, as to the flowage out of the western portion of the State, that is west of the divide, does any of the water flow south out of the area in Montana west of the divide, or does it all flow west?

General CLARK. Sir, some of its flows south temporarily, some of it flows north back into Canada. For instance, the Kootenai comes down into Montana and then turns and goes north again into Canada and joins the Columbia and comes back in the United States as the Columbia as a fairly intricate system. The Bitter Root, shown on the map, the large green area, flows north to the Missouri and follows the Clark Fork on out. The major part of it, Senator, flows westward, but there are variations here and there.

The CHAIRMAN. Can you tell us the amount of water annually flowing out of Montana on the western side of the divide?

General CLARK. Senator, I would like to check the figure for Montana. I have in mind the average figure for the total Columbia Basin but not for Montana alone. May I furnish it for the record?

The CHAIRMAN. I wish you would. I understand 17 million feet leaves the State going east out of the State, finding its way into the Missouri River.

General Clark. I would think, sir, just as an offhand estimate, that it is on the order of 60 million to 80 million acre-feet leaving Montana. That is just as a——

The CHAIRMAN. The total of it for the State, or the part going east?

General CLARK. Yes, sir. No; that is going west, sir—going west to the Columbia, west of the divide, but out of the State of Montana.

The CHAIRMAN. But you will get the figures?

General CLARK. I will get the details. We have the figures, sir. I will have to extract them from the various basins and add them up.

The CHAIRMAN. Very good. Thank you very much, General.

The CHAIRMAN. Senator Murray?

Senator MURRAY. The next witness is Roland R. Renne, president of Montana State College.

## STATEMENT OF ROLAND R. RENNE, PRESIDENT OF MONTANA STATE COLLEGE AND CHAIRMAN OF THE WATER RESOURCES COMMITTEE OF THE AMERICAN ASSOCIATION OF LAND-GRANT COLLEGES AND STATE UNIVERSITIES

Mr. RENNE. Senator Kerr.

The CHAIRMAN. Mr. Renne.

Mr. RENNE. Mr. Chairman, Senator Murray, Congressman Metcalf, it is a pleasure to be here this morning and have an opportunity to speak briefly about some of our water problems.

The CHAIRMAN. Doctor, you are president of the land-grant college; is that correct?

Mr. RENNE. That is correct. I am also chairman of the Water Resources Committee of the American Association of Land-Grant Colleges and State Universities.

The CHAIRMAN. Very good, sir.

Mr. RENNE. I am testifying this morning in the dual capacity, first, as president of Montana State and, second, as chairman of that committee.

I would like to emphasize three things. The prepared statement has a little more detail, which I will give you for the record.

But those three things I would like to mention this morning:

One is to just mention briefly the tremendous needs and the great demands which are going to be upon us for water. You mentioned some of those in your opening remarks, and Senator Murray also.

And as to this discussion of water leaving the State, it is difficult, of course, to get all of the estimators to agree, but the figures we have from our researches and the best data that we can get from other sources indicate about 35 billion gallons or what would be the equivalent of 108,000 acre-feet per day, leaving the State. About two-thirds of that——

The CHAIRMAN. How many billion gallons?

Mr. RENNE. 35 billion gallons.

The CHAIRMAN. That is how many acre-feet?

Mr. RENNE. 108,000 acre-feet.

Roughly, two-thirds, 63 percent going out the west and one-third, 37 percent, out of the east.

The CHAIRMAN. Doctor, I am glad to have a man with such great knowledge and understanding on the stand here. I think that is very helpful. Would you tell me how many gallons per day a million acre-feet provide?

Mr. RENNE. A million acre-feet—I would have to do a little arithmetic. That can be done.

The CHAIRMAN. I know it can be done. I thought maybe you——

Mr. RENNE. 35 billion would be one thirty-fifth of 108,000.

The CHAIRMAN. You lose me.

Mr. RENNE. Yes, sir. Maybe I have lost me.

The CHAIRMAN. I never did get a college degree. I, of course, never had a technical education and neither have I been limited by one, but you sure lost me on that.

Mr. RENNE. I can get that figure for you.

The CHAIRMAN. I just want to know how many gallons a day a million acre-feet provide.

Mr. RENNE. It could be done very easily. It would be about 350 billion gallons.

The CHAIRMAN. A million acre-feet is 350 billion gallons?

Mr. RENNE. That is right.

The CHAIRMAN. Then roughly a million acre-feet provides close to a billion gallons a day, since there are 365 days in the year and if it provided——

Mr. RENNE. That is right.

The CHAIRMAN. Sir?

Mr. RENNE. That is right. You don't need a college education.

The CHAIRMAN. If 17 million acre-feet leaves the State going east and if you have 35 billion gallons a day going out of the State entirely, that would be about the same amount going west, wouldn't it?

Mr. RENNE. 108,000 acre-feet per day leaving the State?

The CHAIRMAN. You said 35 billion gallons per day.

Mr. RENNE. That is right. A third of that is east, two-thirds west.

The CHAIRMAN. I see. They told us over at Billings that the Yellowstone and the Missouri, which join a little way east of the State line carry about 17 million acre-feet of water.

Mr. RENNE. Per day?

The CHAIRMAN. No; per year.

Mr. RENNE. Million; yes.

The CHAIRMAN. And if they do, that would be between 15 billion and 17 billion gallons a day.

Mr. RENNE. That is right. Now, about twice that much goes out the west side.

The CHAIRMAN. I thought you said the total was 35 billion a day.

Mr. RENNE. That is right. Thirty-five billions per day.

The CHAIRMAN. You see, now you lose me. Because if 17 goes out of the east and 35 for the State total, that would leave 18 going west.

Mr. RENNE. The 17 doesn't go out, if that is the figure being used, because the relationship is roughly 2 to 1, east against west. West twice the east. Most Montanans don't appreciate that. They cannot believe that the Missouri isn't bigger than the Columbia, apparently.

The CHAIRMAN. The Missouri is not as big as the Yellowstone when it leaves your State.

Mr. RENNE. That is right. But the Columbia Basin is the biggest drainage by almost 2 to 1. Western Montana has twice the water resources that eastern Montana has.

The CHAIRMAN. Where is General Clark? Now you see the difficulty under which I am laboring.

General CLARK. I am trying to get the figures together for you, Senator.

The CHAIRMAN. Doctor, you go ahead. I am not trying to cross-examine. I am just trying to learn.

Mr. RENNE. In terms of our present development our figures indicate about 1¾ million acres already under irrigation, with a little more than an additional 1 million that can be irrigated and about 300,000 acres that could be benefited tremendously by supplemental water supplies.

In other words, we have developed already more than half of our irrigated acreage potential. But in terms of hydroelectric power our figures indicate about 815,000 kilowatts already developed with a potential of 6¼ million kilowatts, or, in other words, 8 times, roughly.

What I am trying to say is that we are using now 13 percent of our potential hydroelectric power. It is in this field and it is in western Montana, as Congressman Metcalf so well said, that most of our hydroelectric power potential lies.

I would like to express the fact that I am in full agreement with the statements he made concerning the allocation of power for the upstream States based on a formula similar to the Hungry Horse at-site reservation.

The second thing I would like to emphasize is that we have a tremendous need for good research. Good research takes time and it takes money. I think it is high time that we were sure that we were appropriating the funds and making the staffs available to get together the kind of information that will be needed for sound development.

My colleague, Dr. Hide, testified before you at Billings and presented a statement for the record. You will recall that he stressed different types of research that are badly needed. I won't reemphasize those here.

I might mention two or three that he did emphasize, such as weed control, range-management practices, that would not only improve the yields of the range, but improve the effectiveness of the range which makes up so much of our acreage in Montana, improve the ranges as a watershed area for holding and making better use of it. Then I think Dr. Hide emphasized research is needed in water evaporation from the soil and the work that could be done in trying to hold water in the soil for more effective use, pointing out that only 20 to 30 percent of the water that is in the soil is used effectively or directly for crops.

The reduction in losses from canals—about 50 percent of the water in our canals never gets to the farmers' headgates through leakage and wastage. This would be one way by which we could double the effectiveness of the water supplies we do have.

Reorganization of existing irrigation systems through consolidation of ditches, correction of other physical inefficiencies, are all very important phases of research.

It would seem to us that we need a thorough and impartial type of study on the cost-benefit relationships in many of these major projects and a good many of the major construction projects will be in western Montana, because it seems to me we lack that kind of information in many of the instances where there is a lot of controversy and confusion about what should be undertaken.

But the third, and what I consider the greatest, need is for more effective development and coordination of water resources.

I think there is a general knowledge of the lack of correlation or coordination and effective planning at the Federal level. But the leadership to secure that kind of coordination seems to be lacking.

There are four major organizational recommendations that I would like to mention.

One is the establishment of the position of Coordinator of Water Resources, at the Federal level, to provide Presidential direction to agency coordination, particularly the three main agencies, the U.S. Department of Agriculture, Department of Interior, and the Army Engineers, to establish the principles, the standards, and the procedures for planning and development of sound projects.

Second, creation of an independent Board of Review to analyze the engineering and economic feasibility of projects and to report to the Congress and the President through the Coordinator of Water Resources.

Third, the formation of regional or river basin committees with a permanent nonvoting chairman appointed by the President, and with membership made up of all the Federal departments and the States involved and with advisory committees, I might suggest made up of representatives of local interest in the areas where the projects are to be considered.

Last, establishment of a permanent Federal Interagency Committee, advisory in character, under chairmanship of the Coordinator and composed of the principal policymaking officials of the agencies concerned.

Now, three of these four recommendations, Board of Review, the River Basin Committees, and the Permanent Interagency Committee, have been recommended by five major bodies in the past 10 years: The first Hoover Commission on Governmental Reorganization in 1949, the President's Water Resources Policy Commission, of which I was a member, in 1951, and the second Hoover Commission on Governmental Reorganization in 1955, the Commission on Intergovernmental Policy in 1955, and the Presidential Advisory Committee on Water Resources Policy that made its report in 1956.

Now, it is interesting that in the major recommendations the technical or professional people, Mr. Chairman, are in substantial agreement. The problem seems to be to get the necessary legislation and implementation at the Federal level.

The CHAIRMAN. Do you know why they don't get it?

Mr. RENNE. No, sir.

The CHAIRMAN. Metcalf comes from western Montana, Anderson comes from eastern Montana.

Mr. RENNE. That is right.

The CHAIRMAN. It is amazing to the Senate that they are interested in their own districts. Now, I tried to represent Oklahoma. They have got a funny psychology down there. I don't know whether you folks feel the same way or not. They are against any combine they "hain't" in on.

They don't want to make it possible for an Executive that is opposed to any new starts to be any more completely fortified in his position than he now is. They would rather trust the Congress as any Executive they have had or expect to have, and, as highly as they respect the agencies of Government, they feel like their interest is going to be better protected if their representatives in the Congress, the House and the Senate, are in the position of strength they now have, rather than to see dimunition of it, which they fear would occur if the executive agencies by legislation were made very much stronger than they now are.

Mr. RENNE. Mr. Chairman, that leads into my last point about Senator Murray's bill, Senate bill 2549, which he introduced in August, setting up, as you know, a Council of Resources and Conservation Advisers to the President, but at the same time setting up a joint committee of eight Senators and eight Representatives that would study, on a continuing basis, the recommendations of the Advisory Council as well as all other aspects of the conservation and development and use of national resources. It seems to me this bill, which I understand will be having hearings this fall and probably be considered by the Congress this winter, is the first step in the kind of effective coordination that meets this point which you have just brought out because it would have a continuing joint committee of the Congress as well as an Advisory Council in the executive branch together studying these problems and working out a continuing and effective coordinated program.

Thank you very much.

The CHAIRMAN. Thank you very much for a very interesting statement.

(The prepared statement follows:)

STATEMENT OF ROLAND R. RENNE, PRESIDENT OF MONTANA STATE COLLEGE AND CHAIRMAN OF THE WATER RESOURCES COMMITTEE OF THE AMERICAN ASSOCIATION OF LAND-GRANT COLLEGES AND STATE UNIVERSITIES

A statement prepared by staff members of the Montana Agricultural Experiment Station, Montana State College, covering needed research on water resources problems in Montana, was presented to the select committee at its hearings in Billings, Friday, October 9, by Dr. J. C. Hide, professor of soils. I would like to present at this hearing a brief statement concerning Montana's undeveloped water resources and present some recommendations to the committee concerning administrative organization and policy which are desirable if we are to: (1) Achieve effective coordination of functions of the several Federal agencies involved in water resources development; (2) prescribe uniform standards of evaluation, authorization, and reimbursement to assure uniform application of such standards; and (3) provide the President and the Congress with sound advice and recommendations concerning Federal participation in water resources development.

MONTANA'S DEVELOPED AND POTENTIAL WATER RESOURCES

Montana has relatively large water resources which have tremendous potential for improved irrigation, power, and recreational services. About 1¾ million acres are now irrigated in Montana with potential development for at least 1 million more acres, plus supplemental supplies to another one-third million acres.

In terms of power, installed capacity is now approximately 851,000 kilowatts, about equally divided between private and public ownership. Potential hydroelectric development in Montana is about 6¼ million kilowatts, or nearly eight times the existing developed power. In other words, we are using now only about 13 percent of our potential hydroelectric power.

Measurements of the U.S. Geological Survey disclose that an average of about 4.7 billion cubic feet of water (35 billion gallons, or 108,000 acre-feet) leave the State every day, of which two-thirds (63 percent) goes out through the Columbia Basin (Clark Fork River, 38 percent; Kootenai River, 25 percent) and the remaining 37 percent leaves the State by way of the Missouri Basin.

It is apparent from the above data that the irrigable resources have been developed relatively more in terms of full potential capacity than have hydroelectric power resources. In the next two decades, Montana's irrigable acres should be developed to their full potential and this can be done by construction of some large dams, but small upstream dams will also play a very important role. Much of this will be in the western third of the State.

Development of the hydroelectric power potential will be concentrated to a large extent in the western third. Full development of these power resources will probably require more than two decades, and large multiple-purpose dams will probably be the major means of achieving this increased hydroelectric power. Carefully selected sites for these large construction projects will make possible tremendous development of western Montana's great recreational resources. Actually, in the next two decades it would appear that Montana's greatest water resources developments will result in relatively greatest expansion in power and recreational resources.

In a general way, the above indicates where and what types of projects might be most suitable for Montana. Obviously, the construction of major hydroelectric plants will be associated with other important purposes, namely, flood control, some irrigation, and greatly increased recreational uses of water.

ORGANIZATIONAL RECOMMENDATIONS FOR EFFECTIVE WATER RESOURCES DEVELOPMENT

In 1951, the Prseident's Water Resources Policy Commission, of which I was a member, submitted a draft of a water resources bill to the President. The purpose of this bill was to provide for safeguarding and improving the development, utilization, and conservation of water resources, including related uses of land through unified planning and action on a comprehensive multiple-purpose basis in cooperation with State and local governments. Such comprehensive planning and action should include: (1) treatment of all watershed lands, control of floods, and beneficial use of floodwaters; (2) protection and improvement of navigation; (3) reclamation of lands through irrigation, drainage, and other

means; (4) development, generation, transmission, and disposal of electric power; (5) development and improvement of domestic, municipal, industrial, and other water supply; (6) control of pollution; (7) control of sedimentation; (8) control of salinity; (9) preservation and enhancement of fish and wildlife resources; and (10) development of recreational opportunities.

Three of the major provisions of the bill drafted by the President's Water Resources Policy Commission in 1951 were: (1) The establishing of river basin commissions; (2) provision for full participation of State and local interests through advisory committees serving river basin commissions; and (3) the establishment of a Federal Board of Review which would pass on all project proposals and submit such proposals to the President for transmission to the Congress. The objectives of providing a Board of Review were to: (1) coordinate all relevant functions, interests, and purposes during formualtion of plans and programs; (2) assurance of comprehensive multiple-purpose resource development designed to achieve maximum sustained usefulness of resources for all beneficial purposes; (3) recommendations for priorities of undertakings within proposed programs based on sound appraisals of need; (4) recomendations for authorization and appropriations based on sound determinations of economic and engineering feasibility; and (5) recommendations designed to assure effective integration of all phases of Federal participation in resource development within each river basin area and throughout the Nation.

Although President Truman submitted the draft of the Water Resources Act of 1951 to Congress in January 1953, no legislation incorporating the major recommendations of the Commission has been adopted to date.

On January 17, 1956, President Eisenhower transmitted to the Congress the report on water resources policy prepared by the Presidential Advisory Committee, consisting of the Secretary of Agriculture, the Secretary of Defense, and the Secretary of the Interior. The printed report carries a statement of the President that "the conservation and use which we make of the water resources of our Nation may in large measure determine our future progress and standards of living of our citizens. If we are to continue to advance agriculturally and industrially, we must make the best use of each drop of water which falls on our soil or which can be extracted from the ocean."

The report prepared by the Presidential Advisory Committee carried four major organization recommendations which the American Association of Land-Grant Colleges and State Universities at its annual meeting in November 1956, endorsed and commended as a constructive step toward establishment of policies to guide the executive branch in the field of water-resources development. The water resources committee of that association recommended that the association encourage and urge implementation of the report as rapidly as possible through appropriate legislative and administrative action. This recommendation was approved by the association. The four main organizational recommendations in the report were: (1) Establishment of the position of Coordinator of Water Resources to provide Presidential direction to agency coordination, and to establish principles, standards, and procedures for planning and development of water resources projects; (2) creation of an independent Board of Review to analyze the engineering and economic feasibility of projects with this Board reporting to the President through the Coordinator; (3) formation of regional or river basin water resources committees with a permanent nonvoting chairman appointed by the President and the membership composed of representatives of all Federal departments and States involved; (4) establishment of a permanent Federal interagency committee, advisory in character, on water resources under the chairmanship of the Coordinator and composed of principal policymaking officials of the agencies concerned.

At the next meeting of the American Association of Land-Grant Colleges and State Universities in November 1957, the water resources committee of the association made this report: "Our survey of developments during the past year convinces your committee that the carrying out of the recommendations of the Presidential Advisory Committee has lagged seriously, that it is our duty to report such lagging, and to recommend vigorous action by this association to prevent further delay and the resulting disastrous consequences to the Nation's growth and strength."

The water resources committee went on to state that "while it is recognized that some progress has been made on several of the Presidential Advisory Committee's recommendations, the need for more rapid progress is becoming increasingly urgent * * * . We are disappointed and disturbed in the Nation's

interest that no steps are known to have been taken to implement the organizational features proposed in the Presidential Advisory Committee's report to strengthen the water resources program.

"In order that water resources development receive the emphasis and coordination which its growing importance demands, we urge that appropriate steps be taken, through legislation and other means, to establish the position of Coordinator of Water Resources, to provide for an independent Board of Review to analyze the engineering and economic feasibility of water projects, to organize river-basin water resources committees with a permanent nonvoting Chairman appointed by the President, and the setting up of a permanent Federal interagency committee composed of the principal policymaking officials of the departments concerned."

A year later in November 1958, the association's committee on water resources reported that "your committee regrets that it must again report to this association that during the past year no evident progress has been made in carrying out the recommendations of the Presidential Advisory Committee report. The committee again suggests that this association urge the Federal Government, through appropriate channels, to take action promptly, through legislation or other means, to carry out the four major organizational recommendations previously stated."

The water resources committee then pointed out in its report to the association that the population of the United States continues to soar, with a prediction of some 370 million people in 50 years. Analysis of water needs of the Nation at that time gives all States interested in the continued growth and strength of our country very serious concern. Per capita water use more than doubled between 1930 and 1958, and 1975 per capita water use, excluding irrigation, is expected to rise more than 50 percent above the present daily use of about 900 gallons per capita. The committee indicated that in the face of this startling growth and prospects of continued growth and increased water needs, the failure of the Federal Government to take needed action to effectively carry out the basic organization and policy recommendations of the Presidential Advisory Committee is difficult to understand and is dangerous to the best interests of the Nation's growth and strength. The committee stated that "there is general knowledge of the lack of coordination and effective planning which exists at the Federal level concerning water resources, but the leadership to achieve the necessary coordination and effective planning seems to be lacking."

In view of the seriousness of the situation and the continued delay in implementation of the overall recommendations of the Presidential Advisory Committee, which have been generally favorably received by major national bodies most concerned with water resources, the committee recommended that the American Association of Land-Grant Colleges and State Universities again endorse the recommendations of the Presidential Advisory Committee and urge the Federal Government to adopt the major organization and policy recommendations of the Presidential Advisory Committee report as a package through passage of the necessary legislation. The association approved this recommendation and copies of the recommendations were sent to the President, the appropriate committees of the Congress, and to the departments and agencies of the Federal Government concerned.

On August 20, 1959, there was introduced by Senator Murray and others in the Senate of the United States, Senate bill 2549 referred to as the Resources and Conservation Act of 1960. I understand hearings are to be held on this bill this fall and early winter in anticipation of action by the next Congress.

This bill, S. 2549, would create in the Executive Office of the President a Council of Resources and Conservation Advisers composed of three members appointed by the President to assist and advise the President in the preparation of the resources and conservation report and to gather timely and authoritative information concerning natural resource conservation and development trends, and to appraise various programs and activities of the Federal Government in the light of national policy calculated to foster and promote conditions under which there will be conservation development and utilization of the natural resources of the Nation to meet human, economic, and national defense requirements. The Council would make studies regarding matters of Federal resource policy and legislation as the President may request, and make an annual report to the President in December of each year. The bill also provides for establishment of a Joint Committee on Resources and Conservation, made up of eight members of the Senate and eight Members of the House, who would make a continuing study of matters relating to the resources and conservation report pre-

pared annually by the President with the assistance of the Council of Resources and Conservation Advisers, and report each year to the Senate and the House of Representatives on its findings and recommendations concerning each of the major recommendations made by the President in the report. This bill is a first step toward achieving the badly needed coordination and effective planning which does not now exist at the Federal level concerning water resources. It is high time that such a step be taken. It is interesting that during the last two decades, all of the major national survey or policy commissions that have studied organizational needs for effective coordination, planning, and execution of a sound water resources program at the national level have been in substantial agreement on major provisions regardless of the political party in power at the time. The problem, therefore, is not a matter of trying to get agreement among the professional or technical experts, but one of attaining necessary legislation and implementation at the Federal level.

The CHAIRMAN. Senator Murray?

Senator MURRAY. I might say here that Mr. H. T. Nelson, Regional Director of the Bureau of Reclamation, has a statement to file and it contains data on water flow west out of Montana which we have just been considering.

Mr. Nelson, will you file your statement now and give us your figures on the flow of water west out of Montana?

## STATEMENT OF H. T. NELSON, REGIONAL DIRECTOR, REGION I, U.S. BUREAU OF RECLAMATION

Mr. NELSON. I will be delighted to do that.

Mr. Chairman, Senator Kerr, Senator Murray, Congressman Metcalf, my name is H. T. Nelson, Regional Director of the Bureau of Reclamation in Boise.

Our agency has been working in coordination with the Corps of Engineers for a good many years on water resource development problems in western Montana.

Specifically, getting down to the subject, if I may add a contribution to this set of figures on water resources of the Columbia River Basin part of western Montana—our figures show that in the two major streams in western Montana which are apparent on the map at at the back of that statement, there is the Kootenai River and the Clark Fork, that a total of about 24 million——

The CHAIRMAN. Don't get in a hurry.

Mr. NELSON. I will get a map out here, also.

The map happens to cover, sir, only the Clark Fork, which is the—principal tributary area ways.

The CHAIRMAN. That is what I thought.

Mr. NELSON. But up on the left-hand corner, holding the map with the north arrow toward the top where the legend is, that part is the Kootenai River Basin, which is a relatively small part, areawise, so you have the legend, Clark Fork Basin, Montana. That would be the Kootenai River portion.

The CHAIRMAN. In the upper left-hand corner of the map, the Clark Fork Basin area, then, is shown in the shaded area and the other basin, that is the part of it that is in Montana, is shown in the clear area?

Mr. NELSON. Actually, if you were to extend this line and this line, that would be the rest of the Montana in the Columbia River. In other words, this is Clark Fork.

The CHAIRMAN. I am talking about the area in Montana.

Mr. NELSON. Yes.

The CHAIRMAN. Do you see that little four- or five-State map up there in the upper left-hand corner?

Mr. NELSON. That is correct, sir. That is also in western Montana.

The CHAIRMAN. Yes. Now, is the shaded area the Clark Fork Basin?

Mr. NELSON. The shaded area is the Clark Fork Basin.

The CHAIRMAN. And the unshaded area?

Mr. NELSON. Is the Kootenai River Basin.

The CHAIRMAN. Is that correct?

Mr. NELSON. That is correct, sir.

The CHAIRMAN. All right.

Mr. NELSON. Now, then, proceeding, the total yield, the total amount of water that flows from both of those basins into the Columbia River, that is the average annual flow in acre-feet is 24,558,000. Of this amount 16,658,000 originate in Montana and you will see that the balance of about 8 million originates in British Columbia and comes down the Kootenai. From the Montana portion of the Clark Fork the average annual contribution is about 14,240, and the Kootenai in Montana contributes about 2,418,000. So that makes up the total water yield from Montana, west Montana to the Columbia River, of about 16,658.

The CHAIRMAN. Is there any contribution from western Montana to any other river basin than the Columbia? All of the water that flows out of western Montana is in the Columbia River Basin?

Mr. NELSON. Yes, sir.

The CHAIRMAN. All of it?

Mr. NELSON. Yes, sir; that is correct.

I might add a word about your earlier question on Flathead Lake. According to our figures that lake is about 120,000 acres in size, surface area. It has a small dam at the end called Kerr Dam, incidentally.

The CHAIRMAN. Which is it?

Mr. NELSON. Kerr Dam.

The CHAIRMAN. I have been hearing about that. Do you think it is well named?

Mr. NELSON. It is a very old name in this part of the State. Which adds about 1,800,000 acre-feet of irrigation in Flathead Lake. Kerr Dam, incidentally——

The CHAIRMAN. Do you mean there is that much water flowing out of it?

Mr. NELSON. There is more water flows through it. There is that amount of storage in the lake that can be drawn down.

The CHAIRMAN. A million——

Mr. NELSON. 800,000 acre-feet.

The CHAIRMAN. That is the capacity of the lake?

Mr. NELSON. Well, the capacity of the lake, of course, is much higher than that. It has tremendous depths. But the water cannot be taken out of the lake unless the outlet channel is lowered or actually would have to be pumped.

The CHAIRMAN. If it has a constant outlet, after it is filled up, the flowage is just about the annual production?

Mr. NELSON. Except for the dam, which stores 1,800,000 that can be drawn out over and above the inflow. One million eight hundred thousand acre-feet can be drawn out of the lake.

The CHAIRMAN. It would be empty if you did that, wouldn't it?

Mr. NELSON. No.

The CHAIRMAN. No?

Mr. NELSON. Then you get down to the natural lake surface below the sill of the dam.

The CHAIRMAN. I see. That is interesting.

Mr. NELSON. Just very quickly winding this up. A brief comment was made about the strategic position of Montana as an upstream State and the fact that water from Montana can be used over and over again downstream. I would make a remark about the Hungry Horse project, of which I know you gentlemen are familiar. But for the year 1959 for installed capacity at site of 285,000 kilowatts water released from Hungry Horse Reservoir, which has a capacity of 2,800,000 acre-feet through the 3,560 feet of head down to tidewater, added about 900,000 kilowatts to the Columbia River system. All of the downstream plants on the Columbia River are not yet in. So the future total is going to be larger.

I guess I should say a word about irrigation. There are about 365,000 acres irrigated now in western Montana. The map illustrates where they are. The green areas are irrigated. About 122,000 were developed by the Federal Government, primarily on the Flathead Indian Reservation south of Flathead Lake, about 100,000 acres. The Bureau of Reclamation has developed some 22,000 in Bitter Root Valley. The rest of that is largely small private developments using storage built by the Montana Water Board. It is estimated there is about another 288,000 acres within about 200 feet pump lift. So summing it all up, I think the map illustrates that in Montana that the topography is such that future irrigation will largely be confined to rather long, narrow river valleys with pumping lifts of possibly several hundred feet. So the important thing in the future is not going to be water but a source of low-cost pumping power and probably the overall economics is estimated that all present and future irrigation would deplete this tremendous resource by only about 450,000 acre-feet or something like 6 percent.

That completes my statement, sir.

The CHAIRMAN. Thank you very much, Mr. Nelson.

I have just one or two questions.

The figures you gave indicate that insofar as production of water in Montana is concerned about half of it goes east and about half of it goes west?

Mr. NELSON. That would possibly be correct. I am not too familiar with the river-basin site. I have not worked on it in years.

The CHAIRMAN. What is the gentleman's name over there with the Bureau—Clinton, was it?

Mr. STONG. Frank Clinton.

Mr. NELSON. Frank Clinton.

The CHAIRMAN. Do you vouch for him?

Mr. NELSON. Yes, sir.

The CHAIRMAN. He told us there is 17 million acre-feet going out to the east most of which originates in Montana, I understood. Ac-

cording to this portion about the same amount originates in western Montana that flows into the Columbia.

Mr. NELSON. That would be according to my figures.

The CHAIRMAN. In addition to that, western Montana streams carry about 8 million acre-feet additional that really originates in Canada, but goes into the Columbia system by way of your stream?

Mr. NELSON. By way of the Kootenai; that is correct, sir.

The CHAIRMAN. Thank you very much.

(The prepared statement follows:)

STATEMENT ON FUTURE IRRIGATION DEVELOPMENT POSSIBILITIES IN WESTERN MONTANA BY H. T. NELSON, REGIONAL DIRECTOR REGION 1, U.S. BUREAU OF RECLAMATION

The land-and-water resources of Montana on the western side of the Continental Divide are located in two major drainage basins. From these two rivers—the Clark Fork and Kootenai—an average of 24,558,000 acre-feet flows annually into the Columbia River. Of this amount, 16,658,000 acre-feet originate within Montana. The balance of the annual contribution to the Columbia River from these two rivers originates in British Columbia. From the Montana portion of the Clark Fork, the average annual contribution to the Columbia River is 14,240,000 acre-feet. The Kootenai River watershed in Montana contributes an average of 2,418,000 acre-feet annually.

There are an estimated 365,000 acres presently devoted to irrigated agriculture in the Columbia River drainage area of Montana. Federal reclamation projects account for only some 22,500 acres of this total, with the balance made up of small private irrigation enterprises.

There are some 288,000 additional acres in this area which could be irrigated in the future. The greater share of this—about 270,000 acres—would be developed in the Clark Fork River Basin. Some 18,000 acres of the potential lie within the Kootenai River Basin.

From these statistics on water supply and lands susceptible to future irrigation, it can be concluded that future expansion of irrigation in the Columbia River Basin of Montana will be limited by economic considerations and by the land resource rather than by the water supply. One of the economic considerations is the need for an adequate source of low-cost power for irrigation pumping. Such low-cost power could be developed at one or more of the potential large storage sites within the Columbia River Basin in Montana.

In western Montana the Bureau of Reclamation has constructed the Hungry Reservoir with 1,400,000 acre-feet of multiple-purpose storage on the South Fork of the Flathead River, a tributary of the Clark Fork. The Bureau also rehabilitated Lake Como Dam on the Bitter Root project. The balance of irrigation storage in western Montana has been constructed primarily by the Montana State Water Board in a series of small storage facilities.

The Hungry Horse project is an outstanding example of an upstream multiple-purpose storage reservoir. At-site power production at the Hungry Horse powerplant totaled 1,014,791,100 kilowatt-hours during fiscal year 1959. Based on the 1959–60 installed capacities of hydro powerplants downstream, the Hungry Horse project, with an installed nameplate capacity of 285,000 kilowatts, has increased the system prime power in the Columbia River system from 3,950,000 kilowatts to 4,860,000 kilowatts—a total of 910,000 kilowatts. In addition to this tremendous contribution to the power system of the Columbia River Basin—a contribution which will increase as additional capacities are installed downstream—the Hungry Horse project contributes significantly to flood-control and navigation benefits downstream. Future irrigation development can be benefited by this source of available low-cost power.

In the Clark Fork Basin most of the suitable and easily irrigated lands are privately developed and are served by simple, low-cost diversions. Most of the nonirrigated arable lands occur on isolated remnants of terraces with considerable elevations over adequate sources of irrigation water. Typically, the tracts are too scattered to be served by single-project canal systems. High pumping heads, lengthy discharge lines, and relatively small land bodies cause high per-unit costs on all but a few low-lying, compact areas.

Of the 270,000 arable acres, 223,400 are adaptable to surface or gravity irrigation. Of the latter, 19,400 acres are pasture class and 20,500 are timbered. There are 46,300 acres that are best suited for sprinkler-type irrigation. Of these, 8,300 have a timber or heavy brush cover.

Disregarding timber cover as a land class factor, 8 percent of the arable acreage is class 1 quality, 25 percent is class 2 quality, 42 percent is class 3, and 25 percent is class 4, which includes both pasture and sprinkler-class lands.

The effect of irrigation on basin streamflow is and will be minor. The 359,000 acres now irrigated deplete streamflow by about 500,000 acre-feet annually. With irrigation of the 269,700 acres of arable lands, plus development of supplemental water for the lands with insufficient supply, the additional irrigation depletions would be about 450,000 acre-feet. Thus, the total irrigation depletions could approach a million acre-feet, or about 6 percent of the streamflow in the basin.

Most of the easily developed land suited to irrigation is under ditch at the present time. Over the basin as a whole, the limiting factor is suitable land rather than insufficient water supply. The principal bodies of nonirrigated arable lands are located in the Flathead Valley, where over 58 percent of the nonirrigated arable lands in the Clark Fork Basin are located. The remaining acreage consists of smaller, more widely scattered tracts.

In the Little Blackfoot River drainage, because of the small amount of arable land not now irrigated (1,900 acres), the relatively short growing season, and the relatively high cost of providing necessary storage, it is expected that there will be no marked change in the agricultural economy of the valley in the foreseeable future. Grass pasture, beef-cattle enterprise, will continue to dominate the area for years to come without further irrigation development.

In the Deer Lodge, Racetrack Creek area, there are some 52,000 acres presently irrigated, mainly as native grass-hay lands. In addition, there are about 32,300 acres that are arable and dry on the higher and better drained benches and terraces.

The feasibility of delivering water to these dry lands is questionable at the present time because there are no significant multipurpose storage reservoirs in the area, and those that have been considered for irrigation are small and would be rather costly.

Additional irrigation, primarily by individuals, may be accomplished by pumping from ground water, since there appears to be a possible supply. However, a complete ground-water study is yet to be made.

The Flint Creek area from Bimetallic Dam to Drummond is devoted almost entirely to forage crops, principally native grass hay. There are some 27,000 acres presently irrigated with an estimated 10,400 additional acres of dry, arable lands. These lands lie at an elevation of 4,100 to 4,900 feet, and have a short growing season. This limits their usefulness to forage crops. There is little opportunity to develop inexpensive additional storage for the presently dry lands, and it is unlikely that there will be any change in irrigation practice in this valley within the foreseeable future.

The Rock Creek subbasin is a high mountain area similar to Little Blackfoot River subbasin. There are 2,000 acres that may be considered irrigated, and only 900 acres lying in one body that can be classed as arable, located at about elevation 6,100. There are a number of storage sites that have been investigated very briefly that would provide usable storage ranging from 78,000 to about 251,000 acre-feet.

The Bitterroot River Valley is a highly developed area with the better lands already irrigated. These amount to about 111,000 acres. They are adapted to diversified farming that includes hay and forage, some potatoes, sugar beets, small fruit and orchards, as well as permanent pasture. There are 2,900 acres, now dry, that could be irrigated.

In the Clark Fork Valley from Garrison to Bonner, the present economy is raising hay and livestock. Irrigation is practiced on 9,000 acres, generally located in the river-bottom areas. In addition, there are 1,900 arable lands, now dry, that could be irrigated. These lands are 100 to 400 feet above a water supply.

In the Blackfoot River Valley, lumbering and cattle raising are the principal industries. The area is larger than most other subbasins of the Clark Fork. About 20,000 acres are presently irrigated in the entire subbasin. Arable dry lands occur in the four main grass and farmland areas as tabulated.

| | *Arable dryland acres* |
|---|---|
| Potomac Valley | 500 |
| Ninemile Prairie | [1] 4,900 |
| Ovando-Helmville | [2] 15,800 |
| Lincoln Valley | 3,600 |
| Total | 24,800 |

[1] Most of this area would be inundated by Ninemile Prairie Reservoir.
[2] Includes 7,400 acres on Kleinschmidt Flats.

About 15,100 acres of the arable lands are limited to sprinkler irrigation because of their shallow nature. There is an adequate water supply in the valley for irrigation of the presently dry lands only if storage is constructed for the Kleinschmidt Flats area to supplement existing storage built by the Montana State Water Board.

The three most promising developments in the subbasin would be irrigation of Kleinschmidt Flats from reservoir storage; power, flood control, and fish enhancement from Ninemile Prairie Dam Reservoir, and powerplant; and power from McNamara powerplant and reregulating reservoir.

Clark Fork Valley from Missoula to Flathead River has a limited area of valley lands suitable for increased agricultural development, although there are 14,000 acres that are considered irrigated. There are 11,800 nonirrigated acres that are arable. Except for the Missoula Valley area, it is mostly a narrow river canyon. Around Missoula, a number of small irrigation projects and ditch companies have succeeded in irrigating most of the suitable lands. Some attempts in the past to build additional small irrigation developments have been unsuccessful.

Conflicts with other uses prohibit development of a large water-resource project in the river canyon. Studies were made by the U.S. Bureau of Reclamation on four run-of-river powerplants at Plateau, Quartz Creek, Superior, and Quinn Springs. It was concluded that only Quartz Creek had a favorable benefit-cost ratio with a 52,000-kilowatt plant, and it would be dependent on prior construction of Ninemile Prairie project on the Blackfoot River.

Lands lying north of Flathead Lake in the vicinity of Kalispell are the most important dry-farming area in the entire Clark Fork Basin. There are only 12,000 acres considered irrigated compared to 101,100 acres that are arable, now dry. A potential Kalispell project would provide irrigation development for 60,000 acres of irrigable land. At the present time. interest in this project is dormant, but it does remain as one of the larger areas that would permit project-type irrigation development in western Montana.

The area below Flathead Lake encompasses the Flathead Indian Reservation and Camas Prairie. In these two principal areas, there are 101,000 acres under irrigation and 56,000 acres of arable, now dry, lands. Should either Paradise or Knowles Dams be constructed, some irrigated lands along the Flathead River would be removed from production. There is a limited amount of lands along the reservoir pool that could be irrigated. Any development would involve pumping from the pool rather than diverting by gravity, as is presently practiced on the river bottom. There is little opportunity for any substantial project-type development because of the narrow shoestring benches that would be involved.

The Lower Clark Fork Valley from Flathead to the Idaho border is a forested area with the highest annual precipitation and the least agricultural development of any Clark Fork subbasin. Some 3,000 acres are presently irrigated, and 25,800 acres of dry, arable lands have irrigation potential. Nearly half of the latter would be limited to sprinkler irrigation. Of the 13,700 acres suitable for gravity irrigation, 7,100 are still in second-growth timber cover.

Of the 25,800 acres of dry, arable lands, 20 percent are in the vicinity of Plains. This is the only area that is under a proposed schedule investigation by the Bureau of Reclamation at this time.

Because of adequate water supply and suitable sites, three private run-of-river hydroplants have been constructed on the Clark Fork. Cabinet George, just below the State line, has 200,000 kilowatts of installed capacity; Noxon Rapids, 20 miles above Cabinet Gorge, will have an initial capacity of 36,000 kilowatts; and Thompson Falls, 38 miles above Noxon, has 37,500 kilowatts of installed capacity.

Current studies of the Bureau of Reclamation in western Montana encompass three multipurpose projects; namely, Ninemile Prairie Dam and Reservoir, McNamara Dam and Reservoir, and the Spruce Park development.

BLACKFOOT RIVER PROJECT, MONTANA-NINEMILE PRAIRIE DAM, POWERPLANT AND RESERVOIR

In January 1959, a report was completed on studies of the Ninemile Prairie Dam and powerplant on the Blackfoot River, 22 miles upstream from the river's confluence with the Clark Fork, and about 42 miles east of Missoula. The project involved a 300-foot high earth and rockfill dam that would form a 1 million acre-foot storage reservoir with a 60,000-kilowatt powerplant for at-site power development. Power generated at the site would be made available to Bonneville Power Administration for distribution over existing Federal networks. As planned, the project would add about 581 million kilowatt-hours of generation annually to the power systems of the Northwest, both public and private. Of this total, 422 million kilowatts would be added to the Federal system.

The reservoir would provide about 610,000 acre-feet of effective flood control space for control of major floods.

BLACKFOOT RIVER PROJECT, MONTANA-M'NAMARA DAM AND RESERVOIR

This develpment involves a reregulating dam and powerplant on the Blackfoot River, about 9 miles downstream from Ninemile Prairie. Foundation drilling at the dam site is expected to be completed during October 1959. This foundation exploration will furnish information for the design and estimate of the dam and powerplant at the site. The report on this project is scheduled for completion in the spring of 1961.

FLATHEAD RIVER PROJECT, MONTANA-SPRUCE PARK DEVELOPMENT

Spruce Park is a multipurpose development on the Middle Fork of Flathead River. It involves a 410,000 acre-foot storage reservoir on the middle fork, a 40,000-foot-long transmountain diversion tunnel through the Flathead Range, and an 88,000-kilowatt powerplant on the shore of Hungry Horse Reservoir. This plan would provide full development of the water resource of the Middle Fork of Flathead River, utilizing a difference of elevation of over 800 feet between the maximum water surface of the Spruce Park Reservoir and Hungry Horse Reservoir for the development of power. It would also allow greater use of the generating equipment in Hungry Horse powerplant to produce additional power. Releases from upstream storage are usable at downstream plants, both private and Federal. The report will be completed in fiscal year 1960.

The project, as presently planned, would add about 838 million kilowatt-hours of total generation annually. Of this total, 726 million kilowatt-hours would be added to the Federal system. This project, the Spruce Park Reservoir in combination with the 1,700-second-foot tunnel, would develop 500,000 acre-feet of effective flood control space.

Senator MURRAY. The next witness is Dr. Bolle, Montana State University.

Dr. Bolle is not here yet.

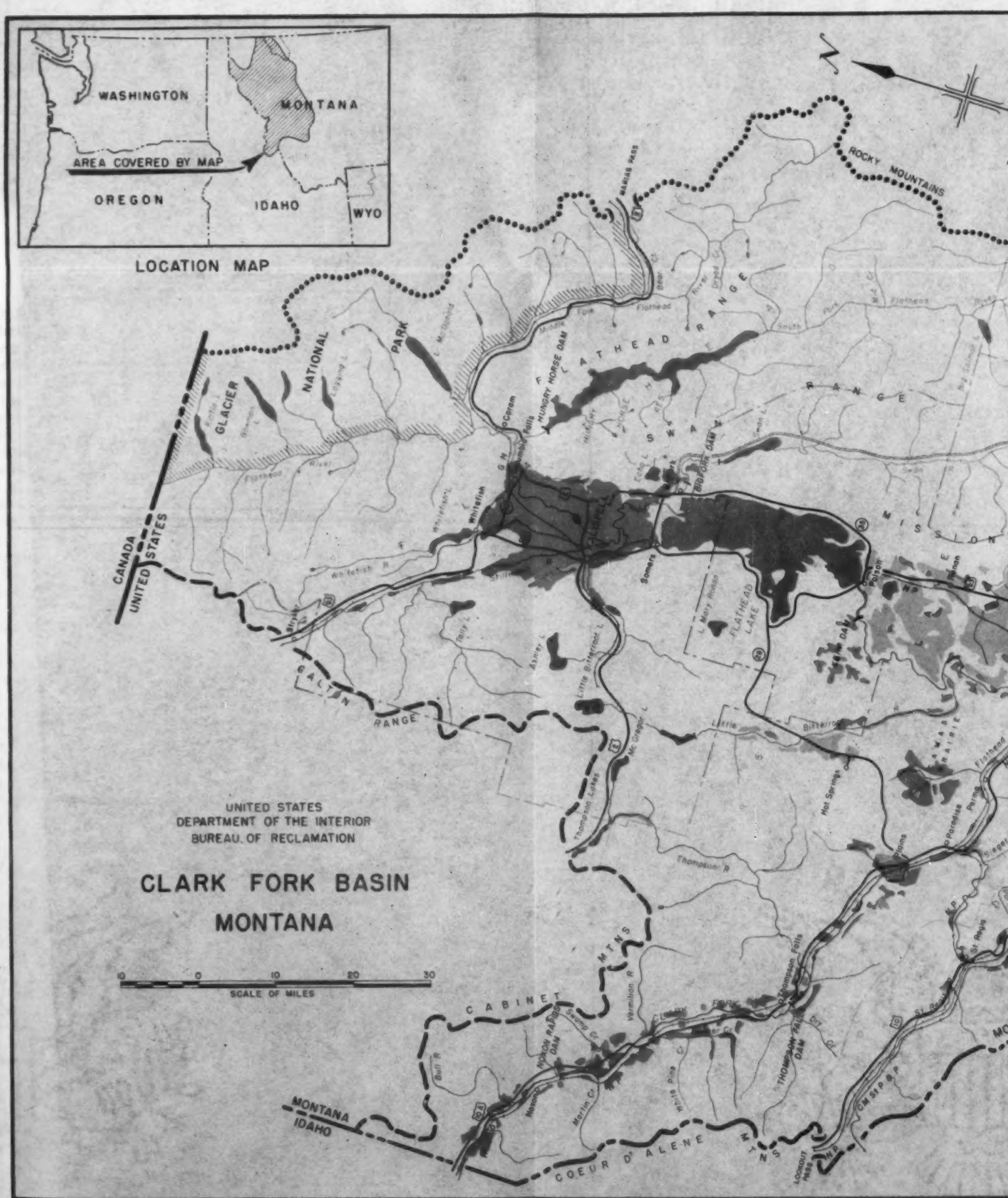
The next witness on the agenda is Dr. Albert W. Stone, associate professor of law, Montana State University, and director, annual Water Resources Conference.

Dr. Stone.

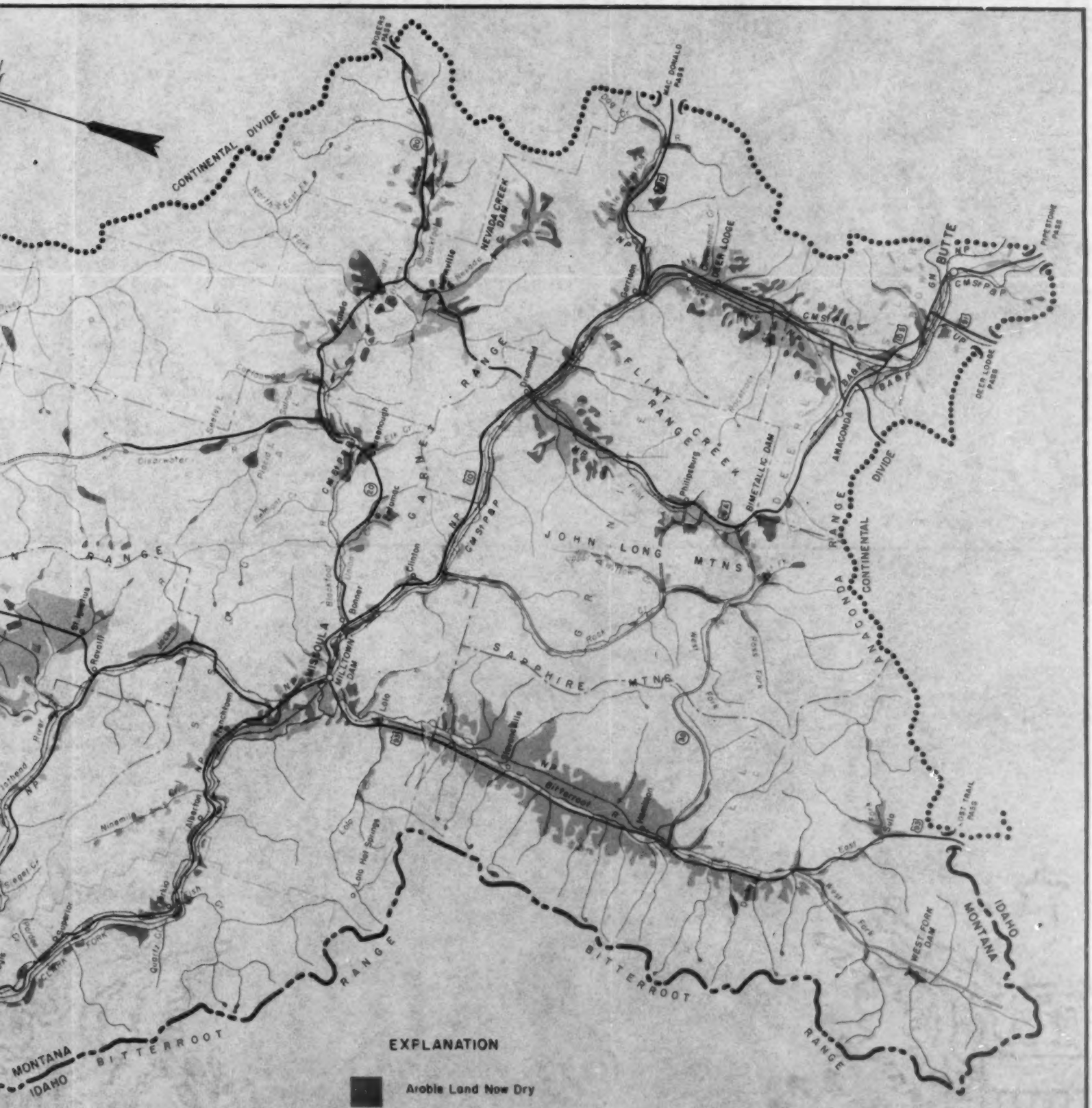
## STATEMENT OF ALBERT W. STONE, ASSOCIATE PROFESSOR OF LAW, MONTANA STATE UNIVERSITY, DIRECTOR, ANNUAL WATER RESOURCES CONFERENCE

Mr. STONE. Gentlemen, I should not be addressed as Doctor. I do not have a doctor's degree. I am an attorney and have a law degree.

The CHAIRMAN. You know, there are a lot of men addressed as judge that don't have the degree.




48186 O -60 - pt. 3 (Face p. 450)


CONTINENTAL DIVIDE
ROGERS PASS
MAC DONALD PASS
PIPESTONE PASS
DEER LODGE PASS
NEVADA CREEK DAM
BIMETALLIC DAM
MILLTOWN DAM
WEST FORK DAM
LOST TRAIL PASS
BUTTE
ANACONDA
DEER LODGE
PHILIPSBURG
MISSOULA
CLINTON
ALBERTON
SUPERIOR
HAMILTON
STEVENSVILLE
DARBY
LOLO HOT SPRINGS
GARNET RANGE
FLINT RANGE
CREEK
JOHN LONG MTNS
SAPPHIRE MTNS
ANACONDA CONTINENTAL DIVIDE
BITTERROOT RANGE
MONTANA
IDAHO
CMSPBP
UP
NP
EXPLANATION
Arable Land Now Dry
Presently Irrigated Land
NOTE:
This Map is Generalized.
Spokane, Washington April 24, 1959 81-122-27

GPO 992545

a

f
w
o
n
t
a
f

n
o
t
u
a
t
i
p
s
t
v

n
r
n
j
t
p

n
o
j
h
r
t
i
t
u
t
o

t
s
i
v

e
a
s
c

Mr. STONE. That is correct.

The CHAIRMAN. You know, not too many professors become doctors and not all doctors become professors.

Mr. STONE. That is true.

Sir, many persons, organizations and interests have ideas and plans for the development of Montana. Many of these have to do with water resources. I have some familiarity with these proposals. Most of the ones having to do with water resources are written in terms of manipulating the physical resources so as to obtain particular objectives with respect to material ends. Among the more common goals are: encouragement of industry, increasing population; protection of fish and wildlife; and increasing irrigated acreage.

Actually, each of these ideas, plans and schemes has a more ultimate goal, often left unspoken. It is the improvement of the welfare of people. Regardless of how altruistic any plan may have been in the beginning, there is a real danger in leaving the ultimate goal unspoken. We get to thinking of industry, population, scenery, fish and wildlife, agricultural acreage and other such things as ends in themselves. Very often this works out well enough. But the danger is in losing sight of the real objective, and letting the means of accomplishing them become the ends in themselves. Unless this tendency is recognized, we very well may develop our water resources in ways that will not ultimately promote a better way of life for our people, whether nationally, regionally, or locally.

You have suggested that I make some remarks on "full development" of water resources. This means to me: "Planning our water resources for the welfare of the people." For most people the economic facts of life determine their way of life. We must consider job opportunities and careers, and in a location such as western Montana we need to promote some diversification of industry in order to provide year-round employment.

The people of the Pacific Northwest are said to be seeking a more mature economy and greater industrial development of the resources of the area. With respect to water resources there appears to be a justifiable need for greater flood control, and an increase in available hydroelectric power. Moreover, river regulation would increase the minimum flow of our rivers and thus permit more water-using industries to locate along our streams. Development along these lines can improve the way of life of many of our people. Moreover, it is in the national interest that the Pacific Northwest should play a grown-up part in the economy of our Nation. There are significant contributions which we can make, and besides, dispersal of industry throughout the Nation may be valuable from a defensive standpoint.

But it is not necessarily a good thing to simply increase the population and make a large-scale industrial expansion our goal. If we were successful in overdevelopment of these means we would also succeed in overdevelopment of many problems of industrial communities which we do not now have.

Notwithstanding that, we must pay considerable attention to our economic well-being. We have seen throughout the Nation as well as in our own region, that basic needs such as food, clothing, and shelter are largely assured to our population. Beyond that, our economy also provides nonnecessaries which enable an individual to live

more conveniently, comfortably, and luxuriously. Along with these attainments has come longer vacations, more leisure time each day, and more people seeking in all sorts of ways means of using this additional time and economic well-being for personal fulfillment.

As we continue to provide a healthy economic climate and improve it, we must look toward providing means for fulfilling individual desires for the better life. Increasingly in the United States this has become a major problem. Recreation, hobbies, TV, and the like have come to play a major role in the American way of life. We now need to provide both economic means and the means for fulfilling personal desires for a fuller, more satisfactory existence.

Western Montana has a unique opportunity to contribute to the national way of life, while obtaining a very wholesome balance in the local way of life.

Our economic opportunity has been mentioned. On the other aspect, one of the strong desires of the people of the more industrial States is the desire to spend next summer in the West. "Let's take the family camping and fishing in Montana's mountains." It will be a new experience for some eastern kids to find that you can actually drink water right out of a stream. This asset of Montana is already a major industry in our State. Alert businessmen have only to capitalize on it, for it is very nearly our exclusive monopoly in a Nation with increasing recreational time and swift means of transportation.

Some dams and reservoirs will enhance this use of Montana and also improve our economic life as well as our own enjoyment of our countryside. Paradise Dam and Flathead Lake are likely illustrations of such multipurpose projects. And upstream there is country where our Nation's people can take vacations away from man's projects and really enjoy something unique, one of the last remaining areas of America's once great wilderness. Our upstream wild areas have a far more unique contribution to make to the national way of life than anything else that the Pacific Northwest can offer. And its value as such will increase year by year.

That, in general terms, is my position, and I know that I am not alone. I realize that the foregoing is in the realm of generalities into specific comments and statements to try to more precisely define the position which I express. Also, I think this committee is entitled to an entirely clear and frank statement.

In yesterday's Daily Missoulian, for the second time there appeared the proposal of the Upper Columbia Development Council for 200 small headwater storage projects. Possibly this has not come to your attention, because to yourselves or anyone with some familiarity with water resources development the proposal is so transparently crude that it doesn't look as though it should be taken seriously. But it should be taken seriously for this reason: it is aimed at the large majority of the public which is relatively uninformed about the techniques of water development, and the plan appears to solve the flood control and hydroelectric problems of downstream States, while improving fish, wildlife, agriculture, and recreation in Montana. It pretends to offer an alternative to Federal projects and all other such development proposals and seemingly has no drawbacks.

Of course it could be criticized on a technical level. The Upper Columbia Development Council does not purport to have investigated

the actual proposed damsites, no core drillings have been taken, no plan for coordinating these multifarious dams is stated. The plan conflicts with upstream wilderness use just as much as erecting structures would interfere with the use of Central Park in New York or Golden Gate Park in San Francisco. All of this with the impression that it would be cheaper to build these 200 saucers than 1 big pitcher.

But criticism on a technical level is pointless. The point is to realize that some groups are cynically attempting to form and prejudice public opinion, so that it will not be possible to make important policy decisions concerning our rivers on the basis of clear public understanding of facts. Success for this proposal of the Upper Columbia Development Council is not the commencement of construction, for surely that is not seriously proposed. Success for this plan is the misleading of partly informed people on a dead-end trail, to make more difficult any progress on any other trail.

Along more positive lines, it seems to me that full development requires building of the Paradise Dam, as it offers more for the future at one site than any other proposal. The Flathead Lake channel improvement proposal should be undertaken also with the limitations contained in the report of the Army Engineers, for that project is economical, feasible, and will not change the level of the lake nor the present use of Flathead Lake or its tributaries. With these two projects there will exist sufficient reservoirs, or lakes, for intensive-use recreational facilities to contribute to our national way of life, and also take recreational pressure off of upstream wilderness areas. With the large contribution which these two projects will make toward flood control and river control for hydroelectric and other purposes, the pressure should also be off of the upstream areas with respect to further impoundments. I hope so. For I think that the people of Montana and of the crowded cities of other States should lose something priceless if Spruce Park, Ninemile Prairie, or similar dams were built.

Thank you, sirs, and my testimony is based on the material in this. May I submit it for the record?

The CHAIRMAN. It will be kept for the record. It will not be included in the record.

Mr. STONE. I won't expect it to be, sir.

The CHAIRMAN. Thank you, Mr. Stone.

Senator MURRAY. J. O. Sowerwine, Director of Montana State Planning Board.

The CHAIRMAN. Mr. Sowerwine.

## STATEMENT OF J. O. SOWERWINE, DIRECTOR OF MONTANA STATE PLANNING BOARD

Mr. SOWERWINE. Gentlemen, due to the fact that I just arrived back into the State, after an eastern trip, this has been prepared rather hastily but I believe we can cover the salient points.

Senator MURRAY. If you wish, you may revise them later on and submit a copy of the revised statement to the committee.

Mr. SOWERWINE. Fine. I will be very glad to do that.

The State Planning Board is concerned with the orderly development of all of Montana's resources to the maximum benefit of all its

people. Its aim is conservation in the broad sense, the wise use of our resources. Next to the people themselves water is the most important of Montana's resources. Fortunately, it is a renewable resource. However, the rate of renewal is strictly limited and at the present time is largely not in our control. Water is used for three basic purposes, human use, including that for domestic animals, transportation, and for the many industries by which man has built civilization. All Montana's industries use and are directly concerned with Montana's water. These include agriculture and related timber, mineral, traction, power, manufacturing, recreation. Some of these many uses, in fact all of them are concerned with the quantity of water. All but power and transportation are concerned with the quality of water.

By quality is not meant simply whether water is good or bad but what the water carries with it, either as dissolved or suspended matter, its temperature, or its turbulence. Water that is of excellent quality for one purpose may be totally unfit for another and vice versa.

It goes without saying that no human plan to use a resource can be very comprehensive until knowledge is known of that resource in the way of inventory. Thus, we must first obtain adequate measurements of what we have now and in the near future, so that intelligent predictions can be made of what we will have in the more distant future. This is the primary basis of all planning. Our board is frequently confronted with the need of data on the quantity and quality of water. Only with sufficient data can we in cooperation with State, Federal, and private groups who are interested in specific facets of the water problem, can we help develop the acme of better living which is possible for the people of Montana and of the Nation.

At the present time there is considerable available data on quantity flow rate in our major streams and there is sporadic quality data of a contemporary short-life type, mostly of bacteria qualities of our domestic supplies. But we have virtually no data on quality for most purposes.

For its own economic survival, Montana in common with our sister States must develop its resources in the way to best fit its people, climate, and geography.

This cannot be done without the data on the quality of our water.

Many technical factors affect the quality and quantity of water available to humans. The main point is that annual precipation is our only source of water. Any methods that we can develop to improve our measurement of this quantity, forecasting its future changes or increasing this artificially where it is desirable would be of benefit to our Nation.

Second, by far our largest consumptive use of water, or waste, as the case may be, is in evaporation. Development of methods of reducing this factor would result in major increases in the total quantity of water aavilable for the many other desirable uses.

The CHAIRMAN. Right there I would like to ask you a question.

Mr. SOWERWINE. Yes.

The CHAIRMAN. I have heard a lot about the elimination or reduction of evaporation. How much of our precipitation comes from the evaporation that occurs in any given area?

Mr. SOWERWINE. To put it in the reverse, about two-thirds of what we receive in the way of rain and snow is lost through evaporation.

The CHAIRMAN. You lose that much?

Mr. SOWERWINE. We lose that much.

The CHAIRMAN. After it falls on us?

Mr. SOWERWINE. Right. That is our major item.

The CHAIRMAN. Now, doesn't part of the rain we get come from evaporation which occurs somewhere?

Mr. SOWERWINE. There is no question about that. All of what we get comes from evaporation somewhere else. In other words, the total amount of water in the world is constant, presumably.

The CHAIRMAN. Yes. Now, if we stopped all evaporation, would we then reduce the precipitation?

Mr. SOWERWINE. I doubt if we stopped evaporation on the land soil over the United States that it would affect our precipitation because the primary evaporation in the world is from the oceans, far more than from land surfaces.

The CHAIRMAN. The rain that we get, then, in the central part of the United States all comes from natural evaporation from the ocean or gulf areas around the United States, in your judgment?

Mr. SOWERWINE. I would say that most of it certainly does.

The CHAIRMAN. Thank you.

Mr. SOWERWINE. The fact that we have dry air.

The CHAIRMAN. What happens to the evaporation that takes place here? Where does that go?

Mr. SOWERWINE. Some of that undoubtedly affects the Midwest States, but the factor——

The CHAIRMAN. Now, if two thirds of all that falls evaporates——

Mr. SOWERWINE. That is in Montana. That isn't true everyplace. But Montana, which is relatively dry, that ratio holds. In Eastern States I would say that it would be very small.

The CHAIRMAN. What part of the precipitation in the Nation would you say is lost by evaporation?

Mr. SOWERWINE. Much smaller than that. Certainly possibly a quarter or less.

The CHAIRMAN. Now, you know Montana is itself bigger than any three States east of the Mississippi River.

Mr. SOWERWINE. That is true. But your dry area of the country is still not much over a third.

The CHAIRMAN. Of the country?

Mr. SOWERWINE. Of the country.

The CHAIRMAN. You knew that parts of Texas were dry at times?

Mr. SOWERWINE. Yes, but your humidity.

The CHAIRMAN. Does that affect your conclusion any?

Mr. SOWERWINE. Well, of course that would have to be actually measured.

The CHAIRMAN. Here is what I am figuring out. If the matter of water in the world is constant, and if we lose a fourth of all that falls by way of evaporation, it occurs to me that if we prevent all evaporation we are going to reduce the precipitation here or somewhere.

Mr. SOWERWINE. Don't forget that two-thirds of the surface of the globe is water to start with. That part you are not going to affect.

The CHAIRMAN. I am not going to forget that.

Mr. SOWERWINE. That is the major portion of your evaporation as far as the plan is concerned, is water surface which won't be affected

by anything we do. So we cannot affect total evaporation, very largely, even if we could control all evaporation where we wanted to.

The CHAIRMAN. Proceed.

Mr. SOWERWINE. One other point is that this evaporation that we have is not all bad. A good percentage of that is necessary and useful.

The CHAIRMAN. If you started out to prevent it, could you tell you were preventing that that was necessary or some that wasn't.

Mr. SOWERWINE. We certainly wouldn't prevent that that we considered necessary. I doubt if we could, in any case.

The CHAIRMAN. How could you tell?

Mr. SOWERWINE. That is a matter of measurement, to find out.

The CHAIRMAN. How would you measure it, in feet and inches or quarts and gallons?

Mr. SOWERWINE. Ultimately it would come down to some unit of measurement over a period time which would be calculated.

The CHAIRMAN. Metric system, you think?

Mr. SOWERWINE. In this country I am sure it would be English system.

The CHAIRMAN. All right.

Mr. SOWERWINE. The water that is available for other uses is the difference between these two, condensation, evaporation. In other words, that leaves what is in our streams and what is in our ground.

I do want to emphasize that groundwater is stored water. It is not a source as many people feel. Its utilization depends on its rate of recharge from surface streams or from underground percolation from precipitation sources which would ultimately go to surface streams when the ground reservoirs are full.

Thus, ground water and surface streams are closely interconnected. So often in our legislation we completely ignore that fact.

Water quality is a variable measured by bacteria, chemical and physical analyses. Quality in surface stream varies hourly by the day with season and longer cyclic geological changes. The quality of ground water also varies, mostly with the rate of use but also with other minor factors.

The main point that I wanted to establish was that measurement of one phase without simultaneous measurement of another is useless. I won't say useless from a preliminary point of view, but it is useless from an overall point of view. We have spent a lot of money in this country in getting water data. As in other things, we have to learn to walk before we can run. But we are to the point now where we know enough about water, where it comes from, how one use, one source, affects another, that we should put our efforts into measurement which won't have to be duplicated.

I feel that is the major point that I want to bring up is that we are spending so much money currently on measurement of water quantity flow rate in various streams and unless we can tie that to our precipitation, to the quality data that we collect at the same time to underground use it will all have to be repeated someday. Now, it is a matter of time, but the quality data we have today is useless. In most cases because we don't have it tied to a specific rate of flow, say, in a stream. As soon as it rains, or in the spring runoff or something, and even just the change from day to night, that quality can change enough

to make it either better or even unfit for some uses. If we don't know what it is, we cannot sensibly determine what those uses are.

I would like to plead that the work that is done be done on a technical basis where each thing is done at the same time so that the measurements mean something to the person in the future that is trying to determine what he has in the way of water quality.

I would like to interject just one other phase which may be of some importance. In Russia they can put technical people in charge of a development such as this, they can come out with a definite set of data, and they can say, "All right, this is what we have." It can be allocated to various uses according to their determination. In this country we have to do at least as good a job. We could either copy their methods and put them all into one central Federal agency, which would have authority to make these measurements and to decide, perhaps a different group on what the water uses would be, or we could keep at least a substantial portion of that controlled in the hands of the States, where they would be able to interject the item of competition and of different ideas which is one of the major differences in our two systems.

I would like to urge that the Federal Government tie in with the States in securing this data and also in determining where this water should be used for the best development of our people in the several States and in the Nation.

Any questions?

Representative METCALF. There are no questions, Mr. Sowerwine. Thank you for your statement. You have permission to revise your remarks.

Representative METCALF. The next witness is Mr. John J. Craighead, leader of the Montana Cooperative Wildlife Research Unit, Montana State University.

Glad to have you here with the committee, Mr. Craighead. You may proceed.

## STATEMENT OF JOHN J. CRAIGHEAD, LEADER, MONTANA COOPERATIVE WILDLIFE RESEARCH UNIT, MONTANA STATE UNIVERSITY

Mr. CRAIGHEAD. Thank you.

Gentlemen, I wish to thank you for the invitation to speak before your committee on the subject of water and recreation.

I am employed by the Bureau of Sports and Fisheries, U.S. Fish and Wildlife Service. The testimony that I make this morning is not official. I am presenting my own views. However, I do believe that many of the views that I will present represent the thinking of many people in our country.

I wish to emphasize from the start that in planning to meet our recreational and fish and wildlife needs there are and will be situations where little or no development will provide the highest social and economic benefits.

My point is not that we should discourage water development, as it is extremely important, but that we must carefully assess the benefits we are now receiving from undeveloped water that has cost the taxpayer nothing. There are tremendous recreational benefits in

keeping some of the Nation's water and watersheds undeveloped. We should keep in mind that we must measure and evaluate the water resources and its use in terms of quality and in terms of fundamental human values as well as in terms of economic benefits and dollar value.

Outdoor recreation is now a major Montana industry. This industry and the benefits it brings to the people of our State is almost entirely dependent on high quality recreational land, which means undisturbed or well-managed watersheds yielding water of a quality to quench the thirst of the mountain man. Fortunately, this is the unique status of much of the water in western Montana at the present time.

Few areas in our country can claim as much. Water is a product of the land and its quality reflects what man does to the watershed and the direct use he makes of the water.

With proper planning and coordination there can be multiple use without abuse. This concept I feel must become a fundamental practice in our society and in Montana in particular if we want to provide high-quality recreation, while simultaneously developing the water resources to optimum capacity for population consumption, agricultural, and industry.

The question that many will ask is just how important is outdoor recreation, should its water requirements be considered on an equal footing with municipal needs, agriculture, industry, and flood control. Economic benefits, both primary and secondary, are tremendous. Estimates of consumers' expenditures for outdoor recreation throughout the Nation indicate $4 to $5 billion are spent annually. It is the leading industry in many areas.

I could give you many statistics on this. I don't want to take the time of the committee now. But they will be in my testimony for the record.

The population projections for the year 2000 are almost twice the present population. However, projected outdoor recreation demand for the year 2000 ranges from 10 to 40 times present use, depending upon distance from centers of population.

There is a fundamental need among our people for outdoor recreation. It has played an important role in shaping our national character. It is essential to our way of life. It is ingrained in our standard of living. Economic returns are only a partial expression of the value of outdoor recreation resources.

The skyrocketing trend in outdoor recreation of all kinds demands that we not only consider outdoor recreation in multiple use planning for our large river systems in the West but that we go beyond this. I believe it is desirable and feasible to establish a national recreational classification for our rivers and streams and to develop a standard recreational rating system for these waterways. Because of the tremendous recreation attractiveness of rivers, the variety of recreational opportunities they offer the public, fishing, swimming, boating, canoeing, hunting, camping, picnicking, and so forth, they should be inventoried and classified according to characteristics that make them desirable and usable for certain types of outdoor recreation.

We cannot——

Representative METCALF. Just a moment, Mr. Craighead. Some of that is going to be done in another area and that is the National

Recreation Resources Review Board which is also created by Congress to do just that, to inventory and classify our various recreational facilities.

Mr. CRAIGHEAD. Yes, sir. I am familiar with that. The point that I wish to make is that this be done on a basis of the river system and on an ecological basis. The information that will be obtained from the Outdoor Recreation Resources Review Commission and from the Columbia Basin Committee, and also from the Forest Service National Resources Review, I have in mind that all of this would be used in such a classification and evaluation.

We cannot as in the past measure and evaluate this resource solely on the basis of man-days of use. We must search for the basic artistics that give them quality and to do this we must recognize that rivers and streams are ecologically fragile and that impounding, channeling, ditching, destruction of bank and watershed vegetation, polluting, and silting drastically and profoundly alter both the water and the shore environments. We must understand the rivers and their watersheds, wildlife, and man's many activities as a social being, are inseparable in considering the use and management of water. Rivers transcend the boundaries of national parks and forests, of private and public lands of municipality, county, and State.

A large river system has millions of miles of shore environment, ranging from wilderness, tributary streams, to fully industrialized shorelines. Such a system embraces mountain, prairie, desert, and coastal regions. It cuts through varied topography, climate, and soil and vegetation types.

The degree and kind of use made of water varies throughout the entire system. Many uses, such as power production, flood control, irrigation, municipal, and industrial consumption are confined to specific portions of a river system. Outdoor recreational use of a river system and its short environment is not so confined. The type and quality of recreation will and does vary from fly fishing and white water canoeing in the mountain streams to motor launching and deep-water fishing in river ponds. Mass recreation is concentrated near the centers of population, small groups, wilderness and semiwilderness-type recreations are largely or exclusively found on the upper reaches of tributary streams and relatively few rather inaccessible portions of the parent river.

But of fundamental importance is the fact that there is practically no portion of the river system that cannot be used for a wide range of outdoor recreational activities, providing the river is unpolluted and its shore environment intact.

I believe that we must recognize and we do that water is perhaps the greatest of all recreational attractions, that it is an essential component of the habitat of a wide range of wildlife species. There are these competing uses vital of our economy. These uses alter the recreational potential but they need not destroy it. They have destroyed much of it in the past, particularly in the East and on the west coast.

If a national inventory and evaluation along the lines I mentioned were accomplished, the recreational uses of our river system would be weighed and considered with other uses. We would learn what the

recreation potential is at present and what we might expect to retain in the future. There are already surveys underway to determine the probable future recreational needs. The Columbia Basin Inter-Agency Committee has inventoried existing recreation areas and facilities in the Northwest and emphasis has been placed on facilities available rather than an inventory of our basic recreational resources and their quality. This is nevertheless a long step forward. The river basin section of the Bureau of Sport Fisheries and Wildlife is doing a commendable job of surveying the status of fish and wildlife on some of the Nation's river systems. The Montana State Fish and Game Department has had the foresight to purchase land along lakes and rivers for public access. The present program is only a beginning. It needs the full support of all Montanans who use and value our water resources for fishing, boating, and water sports.

The U.S. Forest Service is conducting a national forest outdoor recreation resources review which will identify, map, evaluate, and classify forest recreation, including the water areas within national forests. The findings of this survey will prove usable in classifying and evaluating entire river systems.

The National Park Service is conducting a similar review. Perhaps the newly established Outdoor Recreation Resources Review Commission can finance a study to develop a rating system for use in inventorying and reviewing the recreational values of our river system. The Commission has been instructed to inventory our recreational resources on a State by State basis and buy land areas managed and administered by Federal land-management agencies. These agencies will be able to provide much needed information on waterways. But information will of necessity be fragmentary, confined to streams and rivers within specified boundaries. River systems should be inventoried without regard to artifical boundaries. Riversheds and their watersheds are both ecological and economic entities and the whole is equal to more than the sum of its parts and an ecological as well as economic approach is necessary, I feel, to arrive at basic values.

So I wish to suggest here that, for the purpose of reviewing the outdoor recreation potential of our waterways, they be carefully and critically evaluated for present and future recreational possibilities, keeping in mind the multiple-use concept and recognizing that our Nation and people have need for both mass and dispersed recreation areas and a suggested classification might be something like this:

First, wild rivers: those that are free of impoundments and inaccessible except by trail. These streams and their watersheds are essentially virgin. They furnish wilderness-type recreation. Few such rivers exist today.

Semiwilderness: those accessible by road but with watersheds still largely in virgin condition and shorelines undeveloped. They furnish semiwilderness-type recreation for small groups or even for large, mass use, depending on how they are developed.

The semiharnessed, semideveloped rivers, third: they are the ones that are readily accessible by road, impounded or diverted in their lower stretches with developed shorelines, including urban development and characterized by island use on the watersheds, extensive parts of the upper reaches are still unimpounded and undeveloped.

Fourth, harnessed, developed rivers. Speaking of rivers here I am not speaking in terms now of the entire system but the major rivers and also of the larger tributaries. Those rivers that are harnessed, developed rivers are those rivers that are either largely harnessed through impoundment and/or with highly developed watersheds and shorelines. They are characterized by impoundments, artificial channeling, ditching and varying degrees of pollution. Though developed, they may have extensive stretches of water and shoreline, highly valuable or potentially valuable for recreation.

The primary function of a wilderness river, I believe, is the protection of watersheds and scientific educational and particularly recreational use. Recreation is wilderness type and of high quality. Here in the West they are important, if not essential to dude ranching. The water resources can be utilized in many ways farther down the major river system.

The recreational function of semiwilderness rivers is the same as wilderness rivers. They are, however, more accessible, and recreation, though high quality, is not the wilderness type. With proper planning there can be more use of these rivers and their scenic watersheds for hunting, fishing, boating, and camping without abusing the resources. Impoundment should be small or perhaps altogether avoided except in cases where the natural watershed is not stable.

The semiharnessed, semideveloped river has potential for dispersed recreation and for mass recreation, including recreation development sites. The realization of the recreation potential depends upon managing the water and watersheds in such a way that the recreational quality of the water and immediate shore environments is not adversely affected. The harnessed, developed rivers, offer tremendous potential opportunities for mass outdoor recreation. These are generally the lower portions of a river system located close to the users. The present recreation use is usually of mediocre quality. These rivers, if managed for their recreational resources, could provide large and varied recreational opportunities for expanding urban population. Pollution is a major drawback and must be remedied.

Here in western Montana there are streams and rivers with adjoining lakes that should be, I feel, classified and carefully evaluated. Tentatively, on the basis of present knowledge we could classify them as follows for recreational purposes:

Middle Fork of the Flathead River and the South Fork of the Flathead River, from the upper end of Hungry Horse Lake to the tributary sources. This, as you know, is in the Bob Marshall wilderness area.

Semiwilderness and streams: The North Fork of the Flathead River, upper reaches of the Kootenai River, Swan River, including Swan Lake.

We can develop isolated criteria that are generally recognized as giving quality to recreational activity or resource. These can then be incorporated in a numerical rating system that will enable us to rate the comparative quality of any given unit of land or water within the river system.

I would like to say here that the Forest Service in its "Forest Resource Review" has worked out a system, a very good system, I think, whereby such areas can be rated not only from the standpoint of the intrinsic

value but also from the standpoint of the esthetic values. Such a quality evaluation, in combination with an economic evaluation based on use will come quite close to expressing the recreational value of the river system. This, however, will require research effort involving numerous sciences.

It is important that the few remaining wild streams in western Montana be kept intact for high quality, dispersed recreation, the contingency fund for the future. If this were done, future generations could then decide their ultimate use and what types of development, if any, were desirable.

The semiwilderness rivers and streams now play a very important role in the recreation industry of Montana. Plans for the development of these rivers should place a high priority on recreational values, recognizing that western Montana is unique in the Nation as an outdoor recreation region.

Careful consideration should be given before inviting competing industries that might use the water resources but adversely affect the recreation potential. Whenever possible these rivers and watersheds should be developed to enhance the recreation values. Planning should be for high quality recreation rather than mass use of lower quality.

On the semiharnessed, semideveloped rivers and their watersheds other uses of the water have and should take precedent for recreation. However, only water uses that do not destroy the water and shore environment for recreation, I believe, should be encouraged to develop and use the resource. The harnessed, developed rivers of western Montana should and will be highly developed for municipal and industrial and flood control use. There should be careful planning to make the most effective use of water in these lower reaches of our drainage system. Industries requiring water should be located on these downstream river sites. Recreation will be subsidiary but provision should be made for mass recreation sites close to the centers of population. Stream pollution can and should be avoided. One industry careless of its obligation to society can ruin the recreation possibilities along miles of streams and river shoreline.

Some impoundments will be essential in western Montana. A few large storage projects strategically placed on the downstream reaches will provide the optimum recreational potential with the least displacement of fish and wildlife values. A proposed alternative is the construction of many small dams in the upper reaches and small tributary streams. If put into effect this would disturb and in many cases destroy the unique wildlife and recreational values that could not be replaced.

Then, in summary, the water resources of western Montana I believe have unique recreational value. These values will increase manyfold in the years ahead. In the future planning, development, and use of this resource we would be foresighted to recognize that outdoor recreation will in all probability represent one of the highest uses of the upper reaches of Montana's watersheds. Classifying our streams and rivers with regard to present and future recreational value, the evaluating of the quality of diversified recreational activities and determining the permissible and potential recreation capacity of any given unit of a river system will help to insure optimum use of water for

this purpose. Outdoor recreation should receive equal consideration with other major water uses in any well-balanced multi-use water resource policy.

Western Montana still has the opportunity to preserve and develop an outdoor recreation industry of the highest quality, at the same time developing its agriculture and industry. No other area in the United States, excluding Alaska, still has this unique opportunity. Few, if any other regions of our country are so richly endowed with water, scenic beauty, and wildlife. An inspiring challenge and a great trust faces the people of Montana in the years ahead. There is an old saying that the best things in life come free to us. How applicable this is to the recreational benefits western Montanans have been enjoying from their streams, lakes, and rivers. I think that the time has come when we must pay for these benefits with careful planning, clear thinking, and purposeful action.

Thank you very much.

Representative METCALF. There will be inserted in the record at this point a statement by Mr. J. Cornwall, Fairfield, Wash., chairman of the Washington State Soil Conservation Committee and chairman of the research committee of the Washington Association of Soil Conservation Districts, whose statement is on the matter of and very pertinent to the subject matter of this investigation.

STATEMENT BY J. W. CORNWALL, FAIRFIELD, WASH., CHAIRMAN, WASHINGTON STATE SOIL CONSERVATION COMMITTEE, CHAIRMAN, RESEARCH COMMITTEE, WASHINGTON ASSOCIATION OF SOIL CONSERVATION DISTRICTS, MEMBER, RESEARCH COMMITTEE, NATIONAL ASSOCIATION OF SOIL CONSERVATION DISTRICTS

The Washington and National Associations of Soil Conservation Districts have long been interested in the water problems of our State and Nation. Our committees have developed many reports on water and related soil problems which effect the agricultural economy of our State.

In the State of Washington we are faced with a great expansion of irrigated land. Over one million acres will be developed in the Columbia Basin alone, in addition to the vast acreages already developed in the Wenatchee and Yakima Valleys. Many great dams, costing us billions of dollars, store water for industrial agricultural uses which bring vast wealth to our State. These have also created many new problems. Our cheapest water-storage sites have been utilized or developed. We are now faced with the choice of developing more costly water supplies or more efficiently using the water we have now developed. Soil conservation districts are mainly concerned with wise and conservative water use.

As new land is put under irrigation and as farmers continue to irrigate old lands, the problems of efficient use of water are becoming increasingly more serious. For example, accurate information on water requirements of important crops during different stages of crop growth is of vital concern to the irrigation farmer. New methods must be developed for measuring and applying needed amounts of water for the efficient use of water by these crops. Many farmers apply more water than is required for good plant growth because water in our State has been cheap; this is not only wasteful, but damaging.

Much of our good land is becoming waterlogged. Ground water tables have raised as much as 105 feet since the land was first irrigated. Lack of aeration because of too much water at the wrong time is greatly reducing farmers' agricultural returns. Drainage problems are developing much faster than anticipated. Underground drainage is not sufficient to provide free flow of water, thus causing the water table to rise, which in turn is creating saline and alkali conditions on much of our best lands.

We expect salt and alkali damage to increase rather than diminish since the trend is to reuse all available water, including drainage water. Often these waters contain increasing amounts of salts as they are picked up from drainage channels and used on salt-free land. Downstream users are finding these waters less desirable for irrigation and other purposes because of the problem of reclaiming the saline and alkali soils, or removing the damaging salts.

On our dryland areas, water is the primary limiting factor in crop production. Little is known on how to prevent the rapid and damaging movement of water from these dryfarm lands. Erosion caused by the failure of our soils to absorb the snowmelt and high intensity storms is gradually reducing the production on these lands. The questions of how to improve our soil structure, how to increase water-holding capacity, and how to reduce evaporation and plant losses of water give us much concern. We need economical methods of preventing these water losses and reducing erosion. Reduction of these losses would provide tremendous amounts of water that are now wasted. It has been shown from preliminary studies in other parts of the country that tremendous quantities of water can be saved through reduction of evaporation. Cost of doing research on these problems and how to use our present water supplies more beneficially have been shown to be far less expensive than the cost for developing many of our new water projects.

It is evident that some of the greatest opportunities for increasing water supplies will be through the improvement of irrigation and drainage practices; a better understanding of the basic soil–plant–water relations, and more economical ways of controlling water on our nonirrigated lands to prevent water losses, erosion, pollution, and floods.

Agricultural interests, the Nation's major users of water, have called attention to the need for intensified research to halt present water losses in order to meet the growing requirements and demands for water. The National Association of Soil Conservation Districts and our own soil conservation district association in Washington have long been interested in more adequate research attention to the Nation's soil and water resources. Our resource committees have developed many reports and made surveys which call attention to what is happening to these resources. Agencies of the Department of Agriculture, Bureau of Reclamation, and others have pointed out that there is an especially urgent need to increase soil and water research. Large public expenditures have been made to develop our water supplies but unless techniques for conserving and utilizing the wasted water from our agricultural lands are improved, we cannot efficiently use the large supplies developed.

In April 1958, the Senate Agricultural Committee on Appropriations, requested the Department of Agriculture to conduct a study of the soil and water problems of the United States and to make recommendations for facility needs and a program of research to meet those problems. A working group appointed by the Secretary of Agriculture held hearings throughout the country and made exhaustive studies of the soil and water problems. A report was prepared entitled, "Facility Needs, Soil and Water Conservation Research." The Secretary of Agriculture submitted this report to the 86th Session of Congress. So far as it applies to the Pacific Northwest, this report accurately reflects our research needs and we recommend it to your committee. It has been published as Senate Document No. 59.

In emphasizing the need for soil and water research, we must not neglect to mention the importance of putting this research knowledge to work once we have found it. The locally governed, nontaxing soil conservation districts provide a vital and effective link between the various State and Federal agencies and the man on the land. We need adequate means of spreading the findings of research to those who use this information. We need trained technicians to assist landowners in applying these new techniques of conservation and flood prevention to the land. We need public dollars to pay the public share of those conservation practices which are of primary benefit, not to the farmer or landowner, but to the general public—the city man, the tourist, the sportsman, the Boy Scouts, and the factory owner.

Mainly, we need an active awareness of the fact that it is difficult—if not impossible—to manufacture new water and new soil and that our prime need is to make more effective use of what we have. It can't all be done by dams, rivers, lakes, and ditches. We must go to the spot where the raindrops and snowflakes fall—right up there on the farms and ranches of the Nation where the man on the land is the fellow who's going to do most of the work and most of the deciding and most of the financing. Let's not forget this important factor when discussing what to do with our national water resources.

The CHAIRMAN. Mr. Amos J. Alter, Administrator, State of Alaska Water Pollution Control Board, for the Pacific Northwest Pollution Control Council.

Mr. STONG. Mr. Chairman, Mr. Alter could not get here but Mr. Sumner Heidel, deputy State engineer of Montana, has delivered statements for him and they ask that it be filed.

The CHAIRMAN. His statement may be made a part of the records and his statements filed with the reporter.

(The information referred to follows:)

STATEMENT OF MR. AMOS J. ALTER, ADMINISTRATOR, ALASKA WATER POLLUTION CONTROL BOARD, CHAIRMAN, PACIFIC NORTHWEST POLLUTION CONTROL COUNCIL

Mr. Chairman and members of the committee, I am Amos J. Alter, administrator, Alaska Water Pollution Control Office, and at present Chairman of the Pacific Northwest Pollution Control Council. I wish to express my deep appreciation to the committee for granting me the privilege of presenting our views to you on the problems of water resources, so essential to the continued welfare of the Nation.

Mr. Chairman, the council was organized in 1949. The members of the council are the State water-pollution-control administrators and the chief engineers of the State Departments of Health for Idaho, Montana, Oregon, Washington; and I am proud to appear before you today, Mr. Chairman, and to include with these States the name of the State of Alaska. Because we deal with matters of common interest, the supervising engineer of the Department of National Heatlh and Welfare of Canada, located in Vancouver, British Columbia, and the director of public-health engineering of the Province of British Columbia, meet with the council. While the States of Nevada, Wyoming, and Utah do not meet with the council, copies of all council actions and documents are routinely transmitted to these States because small portions of their States are included in the Columbia River Basin.

The council convenes twice a year, and provides a meeting ground for the development of policies and programs comon to the Pacific Northwest. During the 10 years of its existence, the council has established standards of cleanliness for the waters of the Pacific Northwest, has promoted cooperative action by State and provincial regulatory agencies in the prevention and control of pollution of international and interstate streams and cooperates with State, Federal, and other agencies involved in the development of a broad comprehensive plan for water-pollution control in the Pacific Northwest.

Mr. Chairman, we know that your committee and its excellent staff has under preparation many reports and studies establishing the need for action programs and for new legislation to conserve the water resources of the Nation.

Those of us in the Pacific Northwest who are officially charged with carrying out State laws, and Federal laws also in cooperation with the appropriate Federal agencies, are deeply aware of the importance of the work of your committee.

The Pacific Northwest since the days of the Oregon trail has been thought of as America's last frontier. This is largely a historical reference, Mr. Chairman, as you and the members of your committee fully recognize; however, in terms of the Nation's water resources, we are and have every hope of remaining the last frontier in which we have an abundant supply of clean water for the use of our cities and industries, our magnificent fisheries and shellfish resources, and for recreational use of not only the people of the Northwest but of the Nation as a whole.

Accordingly, Mr. Chairman, the statement we have to present to you today will not deal primarily with presenting data about needs, but will be directed to specific areas of interest and their legislative needs. These areas are water supply for domestic use, and for cities and industries; pollution control and international boundary waters.

Before discussing each of these points, Mr. Chairman, the members of this council wish to express their appreciation to the members of your committee and to the Congress of the United States for the significant advances that have been made as a result of congressional action in connection with the improved conservation and utilization of the Nation's water resource. We count among these advances the continued support given to and the excellent programs developed in connection with the Federal Water Pollution Control Act, the provision of new authority to the Corps of Engineers and the Bureau of Reclamation to plan for anticipated future water requirements of cities and industries as expressed in the Water Supply Act of 1958; and the continued recognition given to the

need for safeguarding recreational, scenic, and fish and wildlife values in connection with water-resource developments. The record of the Congress in this important area becomes most impressive, Mr. Chairman, when one adds the contributions made to water-resource conservation through the Department of Agriculture watershed programs.

ON THE MATTER OF DOMESTIC WATER SUPPLY AND WATER SUPPLIES FOR CITIES AND INDUSTRIES

One of the urgent and critical problems confronting us, Mr. Chairman, is the need for assuring for the future an adequate supply of water, safe for human consumption, and an adequate supply of clean water to support industrial development. The problem is essentially one of planning the best use of our water resources to meet these requirements. In the past, communities and industries, and even rural dwellers, were able to plan individually to meet their requirements. Today and in the future, we must plan cooperatively to make joint use of the sources of our water supplies; to plan cooperatively to satisfy broad regional, metropolitan, and multi-city and multi-industrial needs.

The members of this council are the officials charged by statute to carry out State laws in regard to protection of public water supplies, related industrial waters, and other associated activities. The Federal cooperating agency is the U.S. Public Health Service in the Department of Health, Education, and Welfare.

For reference purposes, we should like to note that over 17,000 communities in the United States have municipal water-supply systems serving in excess of 100 million persons. In the Pacific Northwest there are about 1,000 communities with municipal water systems serving in excess of 3 million persons.

The Water Supply Act of 1958 filled part of this need, Mr. Chairman, insofar as Federal water-development projects were concerned.

We recommend a supplement to this action as an amendment to the existing authority of the U.S. Public Health Service either as a new section within the Public Health Service Act, Public Law 410, 78th Congress, title III—General Powers and Duties of the Public Health Service, part B—Federal-State cooperation; or as an amendment to the Water Pollution Control Act, or as a new and seperate piece of legislation. The new and supplemental authority should authorize the Public Health Service to cooperate with States and interstate agencies in planning for the development and use of water resources for domestic, municipal, and industrial purposes.

The purpose of this new authority, Mr. Chairman, would be to make available to the States the extensive facilities, technical knowledge, and trained personnel of the Public Health Service to develop the new methods, technological and economic research, and other requirements needed to facilitate the development of solutions to metropolitan, interstate, and other regional water problems related to these specific purposes. The Public Health Service already has the authority, Mr. Chairman, to cooperate with the States in matters pertaining to research and investigations relating primarily to the quality of waters as they affect human health. The absence of adequate supplies of water are equally damaging to human health as well as economic development, Mr. Chairman, and we believe that this addition will fill a gap in the longstanding traditional programs between the State agencies having responsibility for this work, and the U.S. Public Health Service acting for the Federal Government.

ON MATTERS RELATING TO POLLUTION CONTROL

The programs authorized by the Water Pollution Control Act of 1956 have established a good foundation to meet and solve our vexing pollution problems both in the Pacific Northwest and in the Nation. We hope that the Congress, during the next session, will conclude action on amendments to that act as contained in H.R. 3610, providing for increased assistance to municipalities for the construction of sewage-treatment works and associated amendments to improve the administration of that act.

We recommend that the Congress extend the provisions of section 5 of the Water Pollution Control Act, which provisions are due to expire June 30, 1961. This provision authorizes $3 million each year as grants on a matching basis to the State water-pollution-control agencies to support their technical investigations, enforcement, education, and other activities. In other words, Mr. Chairman, these grant funds are aimed at maintaining strong State pollution-control agencies, to make it possible for them to cooperate with the Federal Government in

the joint Federal-State pollution-control programs established by the Federal Water Pollution Control Act. The State water-pollution-control administrators represented in this council know how important these grant funds have been to the maintenance of our State programs. We urge the continuation of this section of the Water Pollution Control Act.

In general, Mr. Chairman, we are not endowed with the ability to view the future with any degree of certainty. However, with respect to the conservation of the quality of the Nation's water supplies there are increasing signs that unless major technical breakthroughs are achieved during the next half dozen years, an increased portion of our water resources will become unfit for use even with the full application of present-day knowledge for treating sewage and industrial wastes, without approaching a prohibitive cost situation. Such signs are noticeably in the Ohio Valley, in connection with Chicago's problems; at Milwaukee, Wis.; and we are beginning to see similar situations arising in the Willamette River in Oregon, in the Yakima River in Washington, and in other places in the Pacific Northwest. Answers to this problem, Mr. Chairman, need to be obtained now if we are to be in a position to prevent wasting of our waters in the future. The speed and accuracy with which we solve these problems depends solely on the accumulation of new knowledge. This knowledge must come from research.

The Congress has established adequate provisions in law, with perhaps one exception, to meet this problem. The immediate need is for money to expand the research program. Increased appropriations to the Public Health Service will provide for an expansion of research not only by that service directly through the Robert A. Taft Sanitary Engineering Center, but would make possible through their contract and research grant authority expansion of rsearch facilities in educational institutions and other organizations. Here, in the Pacific Northwest, we are attempting through Washington State University; at Pullman; the University of Washington, at Seattle; and Oregon State College, at Corvalis, to seek some answers to these important problems by using grants from the Public Health Service. We are just scratching the surface with respect to the needs. We urge that your committee give due consideration to the expansion of research in this important field in order that we may be able to meet the problems of the future, the signs of which are already upon us today.

In addition, Mr. Chairman, we believe that the proper place to seek many of the answers to the problems of the Pacific Northwest would be through the establishment of a Pacific Northwest regional laboratory of the Public Health Service in order to give more intense study to the problems of this region. The committee may wish to consider this action in terms of other regions of the country as well.

Some of the problems of water pollution in the Pacific Northwest, and certainly Alaska, Mr. Chairman, can be viewed primarily as a contribution to economic development of the area rather then merely to control pollution. If we could get answers to the waste problems, industrial development in our forest-based industries would have greater flexibility for location. This would mean that greater economy could be achieved in the utilization of the most important natural resource of this region; namely, its forests.

In this regard, Mr. Chairman, the committee may wish to consider the following: that the Pollution Control Act of 1956 assists in the solution of municipal sewage treatment through the provision of financial assistance and that at the present time the burden rests entirely with industry to solve their own pollution problems. This policy, we think, is essentially a correct policy. However, the benefits that result from the installation of adequate waste-treatment facilities by industries, and the increasing need to assure the Nation of satisfactory water supplies, leads us to make a suggestion that the committee give consideration to aiding industry through some form of cooperative research program between the States, the Federal Government, and industry.

### ON MATTERS RELATING TO LOW FLOW AUGMENTATION IN FEDERAL CONSTRUCTION PROJECTS

Mr. Chairman, I have previously mentioned some of the important advances that have been made in recent years as a result of congressional action. An important addition which would supplement and make more valuable these advances as well as give support to the water-resource-development programs of the States and the Federal Government would be the ability to use Federal water-development projects to increase the flow in streams, particularly during

periods of low flow. Adding this as an authorized function in Federal projects would make it possible to develop the full potential of reservoir sites, and bring about a general improvement in the quality of waters under regulation. This is particularly important to fish and wildlife and other aquatic life, to municipal and industrial water supplies, the protection of public health, and the recreational use of waters. The benefits from low flow augmentation are general, widespread, and nonspecific and should be considered as a nonreimburseable item in Federal development projects. We recommend, Mr. Chairman, that your committee give consideration to the provision of general authority to the Federal construction agencies to include this element as an authorized function in planning future water-development projects, in modification of existing projects, or in adjustment of operations of existing projects in order to achieve the described benefits.

We further recommend, Mr. Chairman, that the Secretary of the Department of Health, Education, and Welfare through the Public Health Service be authorized to cooperate with the Federal construction agencies in the development of low flow augmentation programs since the net effect of these programs is to control and improve water quality; and further that the Secretary of the Department of Health, Education, and Welfare be required to submit reports to the Congress to accompany Federal construction agency reports insofar as low flow augmentation programs are concerned.

We recognize, Mr. Chairman, that the Fish and Wildlife Service Coordination Act of 1946, amended in 1958, authorizes the Fish and Wildlife Service to undertake similar responsibilities with respect to fish and wildlife. The authority suggested in the above recommendation should supplement the Fish and Wildlife Service program by considering all other aspects benefited by flow augmentation.

There is one important policy point with respect to this matter, Mr. Chairman, that we would like to make perfectly clear; that is, that the provision of augmented flows is not to be used for the abatement of water pollution in lieu of full and complete sewage- and waste-treatment facilities by city, industry, or others concerned.

ON MATTERS RELATING TO POLLUTION CONTROL ON INTERNATIONAL WATERS

Our final recommendation concerns the need for increased cooperation on a formal basis between the United States and Canada, and specifically between the States of Washington, Idaho, Montana, and Alaska, and the Provinces of British Columbia, Alberta, and Saskatchewan on matters of water-pollution control in international waters. These matters are a responsibility of the International Joint Commission, with the States and the United States Public Health Service acting in a technical capacity for the Commission. We recommend, Mr. Chairman, that your committee make note of the need for greater attention to this problem and give support to such actions that will encourage this increased attention.

We thank you again, Mr. Chairman, and members of the committee, for the opportunity to present these views. If you have any questions we will try to answer them.

The CHAIRMAN. Mr. G. M. Brandborg, Montana Conservation Council.

## STATEMENT OF G. M. BRANDBORG, MONTANA CONSERVATION COUNCIL

Mr. BRANDBORG. Mr. Chairman.

The CHAIRMAN. Mr. Brandborg.

Mr. BRANDBORG. I am G. M. Brandborg, of Hamilton, Mont.

I come before this committee today to offer my observations and suggestions as one who, for over 40 years as an employee of the U.S. Forest Service, has been broadly concerned with conservation problems as they affect the welfare of our Nation. For the past 20 years, and particularly since my retirement 4 years ago, I have maintained

an active association with several citizens' organizations concerned with natural-resource problems.

The CHAIRMAN. Mr. Brandborg, in order that I may not be sitting here in uncontrolled astonishment, is that 20 years or any part of it simultaneous with the 40 years?

Mr. BRANDBORG. It is, sir; yes, sir.

The CHAIRMAN. In other words, 40 years with the Forest Service includes the 20 years that you speak of?

Mr. BRANDBORG. Yes, sir.

The CHAIRMAN. If it runs concurrently, I can understand it. If it didn't I was going to be in a little deep water.

Go right ahead.

Mr. BRANDBORG. I am vice president of the Western Montana Wildlife Federation, a member of the Pacific Northwest Conservation Council, and active in several State and national conservation organizations. I am presently serving as a director of the Montana Conservation Council. This is a citizens' organization, created to promote wise use and coordinated development of Montana's natural resources.

The council strives to achieve its objectives through educational programs that are designed to create public interest and understanding of resource-development needs. This involves the job of providing direction for the people of our State and our conservation agencies in the study and discussion of basic problems. From such study and discussion we hope to bring about reconciliation of different viewpoints on long-range resource-management requirements like those that are being considered here today by this committee. We feel that strong public support for sound conservation programs can be generated through thoughtful consideration by concerned citizens. And it was the absence of this approach to our natural-resource problems that brought about the organization of the council. The founders of our organization were firmly convinced that the people of this State must assume leadership in determining the ultimate success of our conservation efforts. They believed, as we do today, that without the understanding and support of people our basically sound plans and programs for taking care of land and water resources can amount to little.

After 11 years, the Montana Conservation Council is more convinced than ever that public and private conservation agencies must assume more active and aggressive leadership in acquainting the people of our State and Nation with natural-resource-development needs and the close relationship between these and the economic, social, and cultural welfare of every citizen of our country.

The Montana Conservation Council has asked me to relate some of the goals and work of our organization to this committee's concern for the coordinated development of water resources.

I wish first to commend the committee for conducting field hearings that will bring us face to face with the critical need for a comprehensive water-resource-development program. This is an excellent opportunity to emphasize some of the basic concerns of the Montana Conservation Council that can be related to the full and coordinated development of all of our natural resources. Suffice it to say that the Montana Conservation Council recognizes water as one of our most important natural resources. We also realize that the job of recon-

ciling use, protection, and development of this resource presents a complexity of thorny problems.

Our experience over the past 30 years with dams in the Columbia and Missouri River Basins has aptly demonstrated our limitations in providing for multiple-purpose development of water resources. We have watched competing factions bid against each other for favorable sites without regard to comprehensive plans that would allow maximum development. We have also witnessed the destruction of irreplaceable recreational assets and wildlife resources of this and other States and of the Pacific Northwest by water-development projects. Important sea-run sport and commercial fisheries have been needlessly sacrificed. Now, with dam after dam lying in their paths as they move into remaining spawning waters of the Columbia that are left open to them, remnants of once great runs have reached a critical stage in their battle for survival. Conservationists realize that either we must allow for the protection and preservation of these fisheries in the remaining spawning streams of the middle Snake River or we must resign ourselves to the ultimate loss of this valuable resource.

Within our State we find some of the richest recreation and wildlife areas that are to be seen any place in the world. Here one can observe an unequaled diversity and number of big-game animals—elk, deer, moose, mountain goat, bighorn sheep, black bear, grizzly bear, coyotes, cougar—and many smaller animals living under wilderness conditions. This is particularly true in the Middle Fork of the Flathead River, the Blackfoot River, and within the Bob Marshall Wilderness Area, the Selway-Bitterroot Primitive Area, Glacier National Park, and other undeveloped areas. The outdoor recreational opportunities of these and similar areas within our State cannot be sacrificed through the construction of water-storage facilities. The loss of these recreational assets, at a time when we are just beginning to realize their great benefits to our people and the economy of the State, is as illogical as would be the construction of dams where they would flood out important agricultural lands and key industrial developments.

It is not my place here today, as a representative of the Montana Conservation Council, to discuss the specific recommendations that have been made by water-developments interests for dams in our State and elsewhere within the Columbia and Missouri River Basins. As you know, serious objections have been raised to some of these projects by competent State and Federal fish, wildlife, and conservation agencies. It is apparent to the committee, I am sure, that if dams are located within national parks or outstanding wild and wilderness areas of the State, they would cause irreparable losses to the region's fish, wildlife, wilderness, and scenic resources, losses for which there would be no compensation.

We ask this committee to carefully evaluate those proposals for dams that are strongly opposed by conservationists because of their impact upon scenic and other outdoor recreational areas. If preserved and carefully managed, these lands can play a vitally important role in meeting our future needs for outdoor recreation and in supporting our local communities.

A number of conservation organizations here in the State, and at regional and national levels, have recognized the need for realistic

appraisal of water-development proposals if we are to achieve the full use of water resources. These appraisals, of course, provide the basis for supporting alternatives to projects that would destroy important outdoor resources. It is interesting to note that a number of our leading conservation groups have come out in full endorsement of projects which they feel will provide the optimum development of our resources without jeopardizing these irreplaceable recreational assets. This is a healthy sign and indicative of their constructive approach to our growing water requirements. We wish to urge, Mr. Chairman, that this committee do all that it can to encourage the study and evaluation of them any complex problems involved in selecting those water-storage projects which will not sacrifice these values or any other of the State's economic or natural assets. We, in Montana, stand to lose too much through shortsighted planning of long-range water-development programs.

The Montana Conservation Council feels that two bills which were recently introduced in Congress, will contribute significantly to the educational work that must be done in giving the people of Montana and throughout the Nation a better understanding of broad resources-development requirements. I refer to S. 2549, the Resources and Conservation Act, introduced by you, Mr. Chairman, in the closing weeks of the 1st session of the 86th Congress. On behalf of the Montana Conservation Council, I wish to commend you and the cosponsors of this bill for assuming leadership in behalf of this vital conservation legislation. I wish also to commend another faithful supporter of conservation, Mr. Lee Metcalf, for introducing the identical bill, H.R. 8661, in the House of Representatives. I would like to illustrate the need for this legislation as recognized by the Montana Conservation Council, and as I have personally observed it during the many years I spent with the Forest Service and as a private citizen who participated in a variety of conservation educational activities.

The Forest Service, as one of our oldest and most highly respected conservation agencies, has always faced a large backlog of urgently needed resource-development programs that have gone begging because of the lack of sufficient funds. Each of these programs would have contributed to better protection, management, and use of forest and allied resources, and each would have contributed significantly to the social and cultural health of the local communities that were dependent upon national-forest products for their livelihoods. In a recent report, the Secretary of Agriculture discloses a backlog of improvement and development needs that represent a staggering $1½ billion. And this accumulation of jobs that need doing does not include additional costs that should be anticipated for increased personnel, research, and other essentials for the achievement of a sound and effective forestry program. A similar report from the Department of Commerce on water-development needs reveal that $50 billion would be required to catch up on our water-resource programs during the next 15 years. And these figures are small when compared with the funds that are so urgently needed to implement small-watershed improvements, programs for pollution control, wildlife, recreation, and the more intensive management of our vast public-land estate that is administered by the Bureau of Land Management.

The Montana Conservation Council places the blame for this serious backlog of urgently needed conservation work upon our failure as agencies and private conservation organizations to give people—the folks we know and see every day in the towns and cities of Montana and throughout the Nation—a broad understanding of our land and water problems. We have failed to give these problems meaning and to keep alive, in the minds of people and our public conservation agency personnel, the conservation ideals and philosophies of Teddy Roosevelt and Gifford Pinchot, the early-day conservation crusaders. Advocacy of their philosophies by public-agency representatives is required if we are to rekindle a public consciousness of our critical need to provide adequate care and protection for our natural resources. It is a sad commentary on our present-day conservation-agency programs that one seldom hears representatives of these agencies express the ideals of Roosevelt and Pinchot; it is simply no longer in vogue for the professional conservationist in a public agency to espouse these fine principles and to openly express his beliefs. To correct this shortcoming, we must initiate broadly oriented inservice training programs within our educational institutions and conservation agencies that will provide their people with social and philosophical understandings that they must have in order to work effectively with the public.

On behalf of the Montana Conservation Council, I wish to urge members of this committee to give consideration of S. 2549 top priority in the 2d Session of the 86th Congress. This is one of the best media that we can see in Montana for laying the foundation for the full development of our natural-resource program. This measure can bring about an awakening of private and public conservation agencies so that they can take resource problems to the people and solicit their support for basic long-range programs. These agencies are too widely separated now to come forth with resource-development programs to meet our needs. Enactment of this bill can help to implement desired educational programs and the development of effective working relationships between Congress, agencies of the executive branch, and the people of our Nation.

The Commission, provided for in the bill, would keep the President currently informed of resource-management needs and opportunities. Without such leadership and direction from the Executive Office, the backlog of critical resource problems will not only grow larger, but will be accompanied by many serious inroads upon our basic soil, water, mineral, forest, wildlife, and recreational resources. Annual reports on natural-resource needs, as called for in the bill, can become charters for action. This will be in contrast to our present situation in which we find so many sound resource-management programs and recommendations gathering dust in the libraries and files of agencies who have failed in their efforts to present vital resource problems to the people in a manner that will give these problems full significance and meaning.

The Montana Conservation Council sees S. 2549 as a real opportunity to develop some of the effective working tools that are so badly needed for full development of our Nation's natural resources. We urge its enactment.

Thank you for the privilege of appearing here today.

The CHAIRMAN. Thank you, Mr. Brandborg, for a very interesting and constructive statement.

Senator Gordon McGowan, Highland, Mont.

## STATEMENT OF SENATOR GORDON McGOWAN, HIGHLAND, MONT.

Mr. McGOWAN. Senator Kerr, Congressman Metcalf, I wish to thank Senator Murray for the opportunity to appear before this committee.

My name is Gordon McGowan, from Chouteau County in Montana. For the past 2 years I have been chairman of the irrigation and water-conservation committee in the senate of the State.

I believe that before we in Montana will benefit from your hearings we are going to have to do two things to get our own house in order. Primarily, this would be them:

In the first place, my remarks will be confined to ground water strictly and in Montana we have no underground-water code.

The CHAIRMAN. What?

Mr. McGOWAN. We have no underground-water code in the State of Montana.

The CHAIRMAN. No State legislation with reference to it?

Mr. McGOWAN. That is right.

The CHAIRMAN. With reference to rights for underground water?

Mr. McGOWAN. That is right, Senator.

In the second place, we are badly in need of additional funds from the State to match the Federal funds for more exploratory work to determine just what we have and how much of it.

For one further light on that subject, I might add that in 1951 and in 1953 bills were introduced but both died in committee.

In 1955 another one was introduced and died on the floor of the senate and in 1957 the soil-conservation districts of Montana, from their knowledge gained from other States, conceded that Montana should have underground-water legislation. And they thought that they could prepare such legislation and not be accused of having selfish interest and try to do a decent job for the greatest number. That bill was prepared and we fought it through the last session of the legislature but again lost the bill.

So we are having a difficult time getting an underground-water code in the statutes of Montana.

I made the statement many times to members of the committee.

Ground water, that is water below the earth's surface, is without a doubt one of Montana's greatest assets, the least known and the least appreciated natural resource.

Without ground water the distribution of our population would have to be shifted, the economy would be affected, and State development would take on changing aspects. For example, almost the entire rural population, more than 80,000 people in 78 communities, now using ground water for domestic purposes would be restricted to localities where surface water is available for use.

The stock-growing industry, almost entirely dependent on ground water, would be restricted to areas close to lakes and streams. The base flow of most streams is dependent on ground water and this flow, ground water, practically governs all irrigation and power development along the streams that are not provided with surface-water reser-

voirs. The present use of ground water in Montana is a very small part of its potential use. It is so hard to understand that so little is known about this valuable resource. Only in a few places in Montana have comprehensive studies of ground water been made. This being done by the Ground Water Branch of the U.S. Geological Survey as a part of the investigational program for development of the Missouri River Basin or under the cooperative program for development of the Missouri River Basin or under the cooperative program with the Montana Bureau of Mines and Geology, which is now entering its fifth year.

Of the 16 Western States, 12 of them have underground-water laws; namely, Colorado, Idaho, Kansas, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington, and Wyoming. Strange as it may seem, all the States that border Montana have underground-water laws, yet Montana, which has the headwaters of two great rivers, the Missouri and Columbia, has no ground-water law.

There are many interesting facts and figures available from other States which very clearly indicate the need for more and more knowledge of underground-water sources, exploration work for new areas, knowledge as to the amount these areas contain, and what type of water it is, as well as the ability of nature to recharge these areas. I will not attempt to cite facts and figures from other States but will confine my remarks mainly to the State of Montana. The following information was furnished to me by Dr. Frank A. Swenson, of the Underground Water Branch of the U.S. Geological Survey:

Mr. Swenson states:

Nearly all the major streams in Montana flow for long distances in valleys underlain by 20 to 400 feet or more of unconsolidated gravel, sand, and clay. These unconsolidated materials locally offer possibilities for development of large supplies of ground water for irrigation, industrial, or municipal use. The best possibilities for development of large supplies are in the west and central parts of the State, but good possibilities exist also along the Milk, Musselshell, and Yellowstone Rivers, and along the Missouri River below Fort Peck. Between Havre and the confluence of the Milk and Missouri Rivers, the Milk River occupies a former course of the ancestral Missouri River. This part of the Milk River Valley is underlain by about 100 feet of unconsolidated material and, in some places, wells penetrating this material are capable of furnishing more than 1,000 gallons per minute. Because the aquifer is recharged by the Milk River and also by the percolation of irrigation water applied to large acreages of land in the valley, much greater use of ground water is possible in this area without serious depletion of this ground-water reservoir. The hydrologic conditions are similar along the Missouri River downstream from the confluence with the Milk River at least as far as Poplar and possibly to the State line.

The unconsolidated deposits underlying the valley of the Musselshell River are reported to be as much as 50 feet thick and some 500-gallon-per-minute wells exist. The unconsolidated fill underlying the Yellowstone River Valley is as much as 100 feet thick near the mouth of the river, but is considerably thinner upstream. Some large-capacity wells are present in the lower valley but the potential is much greater than the present use.

In the western part of Montana, several intermontane basins are underlain by thick and very permeable unconsolidated deposits. The basins we know most about are the Gallatin, Helena, Bitterroot, and Townsend Valleys, but there is reason to believe that the Beaverhead, Three Forks, Deer Lodge, Missoula, Jocko, and parts of the Flathead Valley may offer good possibilities for development of large ground-water supplies. Test drilling in the Gallatin Valley has shown that parts of the valley are underlain by more than 400 feet of very permeable water-bearing gravel that is capable of yielding extremely large supplies of good-quality water. Because the recharge to the ground-water

reservoir in this and in other intermontane basins in Montana is great, the serious depletion of these aquifers is unlikely. Recently I have received reports on wells drilled near Dillon in the Beaverhead Valley which yield more than 2,000 g.p.m.; wells in the Missoula and Flathead Valleys which yield more than 1,500 g.p.m.; and many other large-yield wells in the above-mentioned basins. These reports confirm my belief that large supplies are not only available—their development is starting.

Several bedrock aquifers that are potential sources of moderate to large supplies of ground water underlie much of Montana east of the divide. Throughout large areas these aquifers, although present, are so deeply buried by overlying material that their depth is greater than the present economic drilling limit for water; however, in several places, large to fairly large flows of water have been obtained from these aquifers by oil-test wells. Some of these test wells have been sold to the ranchers and the water is being used for stock watering and irrigation of hay meadows. Among the aquifers from which such flows may be obtained locally are the Kootenai, Heath, and Embar formations, the Tensleep sandstone, and the Madison limestone. On the flanks or tops of the Pryor, Beartooth, Bridger, Belt, Crazy, and Big Snowy Ranges at least some of these formations are exposed in highlands where the recharge is potentially large. Although these bedrock aquifers may prove valuable locally, the potential development of these sources of ground water is nowhere near as important as is that of the unconsolidated deposits.

This information pertains to the knowledge we already have and some potential information which has been compiled by this agency. The discovery of new artesian wells in Chouteau County in the Geraldine and Carter areas in the last 6 months are beginning to indicate that this whole area extending to the north side of the Missouri River indicates a large area of good artesian water. As recently as 30 days ago, a well drilled to the depth of 1,618 feet just north of the town of Carter, which is 30 miles north of Great Falls with a 2-inch casing, brought in a flow of water 20 gallons to the minute with approximately 70 pounds pressure. I was informed last night by telephone this well increased now to 30 gallons per minute.

Chouteau County, as you may know, is one of the largest wheat-producing counties in America. Many farms and ranches haul all their water from other areas. Discovery of water here would have a tendency to change the whole economic outlook of this particular area.

There is still much need for a great deal more information and good underground water laws to protect those who have made the original investments.

I have been informed by well drillers, as well as many others with knowledge of our geological formations, that many wells are being drilled in Montana as well as many seismograph crews drilling test holes and they are being left open and not sealed off, allowing the mixing of water from one stratum to another, and in some instances the complete loss of a good water supply. This they contend is a capital crime and we must have legislation to prevent such.

I feel, Mr. Chairman, I would be neglecting my purpose here if I failed to sight the almost unbelievable figures released by Mr. H. R. Stucky, head of agricultural economics at New Mexico's A. & M. College. I quote from his findings: In 1930, only 11 percent of New Mexico's land was irrigated while in 1955 it had jumped to six times that figure, or 66 percent. The number of irrigation wells in New Mexico increased from 300 in 1934 to more than 30,000 in 1955. Can there be any question about the need for better understanding of our underground water supply?

48186—60—pt. 3——10

It has been estimated that these natural reservoirs hold several times the quantity of water that exists at any one time in all the streams, lakes, and manmade reservoirs on the land surface in the United States, even including the Great Lakes which hold many times as much water as the rest put together. These underground reservoirs constitute a last water reserve for an ever-increasing population. With proper knowledge of such an intelligent use we can stabilize and increase dependable water supplies of numerous areas. I am highly confident that Montana has many such areas capable of bringing innumerable changes to the State that will in turn supplement the wealth of the State by adding to our tax base, bringing more people to share the burden; and perhaps most important of all, resulting in more secure agricultural and industrial operations which makes for a better way of life for all.

I hope I have made myself clear so you can understand my enthusiasms and firm convictions that underground water is the greatest undeveloped resource left in Montana.

Thank you very much, Mr. Chairman.

The CHAIRMAN. Thank you very much, Senator McGowan, for one of the very best statements any witness has given.

Mr. MCGOWAN. Thank you.

The CHAIRMAN. We have a letter from Gareth C. Moon, State forester, submitting a statement of the State forestry aspect of watershed management which is being submitted and will be made a part of the record.

(The information referred to follows:)

STATEMENT OF GARETH C. MOON, STATE FORESTER, MONTANA

STATE FORESTRY ASPECTS OF WATERSHED MANAGEMENT

Montana lies astraddle the Continental Divide which constitutes the headwaters from which two great river systems originate. In its farflung effects throughout these two immense river basins, water is a resource of greatest importance.

The office of State forester is interested in water from two main standpoints:

1. What, in the management of State forests, will affect water quantity, quality, and timeliness of flow?

2. How will the pollution of water affect the dependent downstream areas in Montana?

It is becoming increasingly obvious that water in sufficient amounts at the right time and of good quality will eventually become the most important products of our forests. Water, as we know, is indispensable. The seriousness of daily water shortages across the Nation cannot be overemphasized, particularly throughout the semiarid West. Managers of land and water resources must find and install better ways to conserve and increase the supplies of available water.

The bulk of the water available for use in the Western States comes from deep winter snowpacks concentrated in high forested regions. The correlation of soils and forests in their ability to absorb and retain water, especially under the impact of the many different uses, is the major challenge and law of land management.

Forest research is pointing out that water production of a given watershed system can be increased by the proper manipulation of vegetative cover. Research shows that such investigations are in their infancy, and the application of data must be tempered by consideration of the kinds of soil, the steepness of the slope, climate, economic importance of other crops, whether they be timber, grass, wildlife, or recreation, and the net effect of altering nature's complex relationships.

Water, as a crop, cannot be satisfactorily compared in value to other forest crops because water is usually not sold and, therefore, does not show up as forest receipts. However, some appreciation of the value of water in and to the North-

west is indicated by the fact that in addition to several billion dollars invested in water-handling structures and facilities in the Columbia and Missouri River Basins, untold billions in agricultural and industrial reliance are placed throughout these basins on anticipated adequate supplies of clear usable water from Montana watershed. Thus the emphasis on water as a forest product is a major concern in how we manage our forest lands.

Uncontrolled fire by destroying plant cover, humus, and soil structure, seriously alters the soil's capacity to store water for later seasonal release. If the protective plant cover is destroyed, the soil beneath becomes vulnerable to erosion, thereby compounding the detrimental effects of fire. The importance of high elevation watersheds plus the unpredictability of unsuppressed fire constitute the main reasons for a hard and fast policy of quick and aggressive action on fires.

In the field of timber management exists the opportunity for either benefits or damage to the watershed. Cutting timber in harvest must reconcile the growth habits of the tree and yet not unduly expose the soil to the forces of erosion. Cutting practices in stream bottoms that might seriously alter channels of water temperatures are carefully avoided. The State requires of its operators a logging plan which must provide for roadbuilding and skidding practices which minimize erosion and its effects of siltation of streams and reservoirs. Additional precautions are taken on less stable soils. Roads are carefully and properly located on grades that are not conducive to wash. Berm ditches and water turnoffs are constructed.

Damage to the forest by insects such as the spruce budworm and spruce bark beetle has a direct relationship to the watershed. If these insects are left uncontrolled, experience shows that, in addition to the possibiliy of exposing more soil, the fire hazard created from the dead timber can bring about disastrous fires which, in turn, will affect water production levels and siltation effects.

In a constant effort to improve the timber stands through thinning, planting, pruning, and proper harvest, careful consideration is given to the watershed aspect.

In the field of range management on forest lands, it is equally true that land in a healthy condition best lends itself to the production and stability of water supplies. The special properties of various plant species to hold soil in place and to promote rapid infiltration of water is important. The numbers of livestock and wildlife allowed on a given range and their effect on the perennial vegetation distributed over the range are carefully weighed in the leasing of State forest grazing lands.

The use of the forests for recreation is increasing daily. With the increase in population in some of the major cities of Montana and a consequent seeking of the quiet of the forest, these folk are bringing a tremendous demand on the forests for all types of recreation. As use for recreation increases, sufficient facilities to safeguard streams from pollution become essential. With these proper safeguards it appears that these areas can be used for many purposes. Sanitation installations, good water systems, picnic facilities, garbage disposal, the location of fireplaces—all become factors in the problems preventing and reducing possibilities of pollution.

The effect of forest industry on the water are dependent largely upon the type of business, location, utilization, statutory requirements, and many other factors. Fish and wildlife biologists point out that sawdust deposited in rivers and streams has an adverse effect on fish and plant life. Consequently Montana has a rigid law controlling this problem. When properly located with respect to the size and minimum-flow characteristics of the streams and by exercising necessary sanitation requirements, modern forest industries can produce almost any forest product and not pollute the water they are using. It is important that as new industries develop proper regulatory legislation be enacted in time to prevent pollution and soon enough to protect the investments of industry. Forest industries are generally eager to abide by antipollution laws that are fair and not subject to change with the meeting of each legislative session.

Water is fast becoming one of the most critical aspects of our management program whether it be forest, range, crop, or wildlife. State foresters are concerned with water quality control or sediment control. It appears that on the Columbia River side of the Continental Divide holding down high waterflows from spring runoff gives us a particular problem in siltation and stabilizing the soil. On the Missouri side the problem appears to be increasing water yields without setting of soil erosion and sedimentary problems.

The CHAIRMAN. Mr. DeMar Taylor, Montana Reclamation Association.

## STATEMENT OF DeMAR TAYLOR, MONTANA RECLAMATION SERVICE

Mr. TAYLOR. Mr. Chairman, Congressman Lee Metcalf, Senator Murray, members of the committee:

I have listened with interest to those who have preceded me. I have envied their position in that they were qualified in their field. I am just a plain water user from Dillon, Mont., who depends upon a little irrigation water to pay the grocery bill.

Representative METCALF. Mr. Chairman, may I make a comment on that?

The CHAIRMAN. Yes.

Representative METCALF. Mr. Taylor is one of the witnesses that has testified a good many times before both senatorial and congressional committees in support of the East Bench project in the headwaters of the Missouri, one of the five new reclamation starts for which appropriation was received this year. He is certainly no novice in this business of appearing before congressional committees and he was one of the successful applicants for a new start in this Congress.

The CHAIRMAN. I always listen with great interest to these possessors of great modesty. It is one of the most effective acts presented before the committee of the Senate.

Go right ahead.

Mr. TAYLOR. Thank you.

At this point I hope it would not be out of order to compliment all of those who have contributed to the success of the East Bench unit. We are well aware of the untiring efforts and the faithfulness with which our own delegation has worked on this project and we are also aware that they needed a lot of support from men such as you, Senator Kerr, and on behalf of the people from our part of the country we want to congratulate and extend our appreciation for this badly needed project.

I don't think many people realized just how badly this project was needed in view of the fact of the interstate highway that was going to be built in the next year, right through the center of the dam and the millions of dollars that would be added to the cost of the project if we did not get an appropriation this year. As a matter of fact, they would probably have eliminated the project because it would not have been worthwhile in view of——

The CHAIRMAN. It would not have been economically feasible to relocate a big highway after it was built.

Mr. TAYLOR. That is right.

The CHAIRMAN. Fine.

Mr. TAYLOR. In relation to the irrigation in the State of Montana, I think we all realize that Montana is in a deficient rain belt area, and that there is only 2 percent of the gross acres in the State of Montana that is presently being irrigated. In deficient water years, rainfall years, this 2 percent produces up to 60 to 65 percent of the crops produced in Montana. I think this will give us a brief outlook as to the importance of irrigation within the State.

Private enterprise has developed a good share of the water that has been developed up until the year of about 1905. Since then the Bureau of Reclamation and the State water board have made sizable contributions to the water development within the State. All of the easy projects, the uncostly projects have been developed, and from now on it is going to take Federal moneys to develop our water resources. The water users are well aware of the fact that it is going to be costly and they are willing to enter into contracts with the Government to reimburse the Government for the expenses that are incurred in developing these waters.

Now, as to where and when this water should be developed, I personally think that at all times there should be a committee in the field, whether it is the Bureau of Reclamation or somebody else, evaluating the circumstances of these irrigation areas and projects.

First of all, I don't think that projects should be developed necessarily that will contribute to our national surpluses of products. I don't think that is the case in Montana because Montana is basically a livestock State. With the exception of our dry farming wheat areas, we contribute very little to our national surpluses.

As you have traveled about the State I am sure you noted with interest the thousands upon thousands of acres that are being grazed by our livestock. These livestock are coming into little concentrated areas, to this 2 percent that is being irrigated and depending on it for their winter feed supplies. I think it is very important that we stabilize and equalize our winter and summer needs. In a lot of our areas our farmers and ranchers are going out of State buying high-cost feeds to winter their livestock. I am sure that is going to be the case this winter.

So I think that we should be aware of the fact that our rivers are overappropriated. All down through the annals of history people have been flowing over our boundaries, seeking agricultural opportunities for expansion and they have been taxing our water supplies greatly. The old, original water rights have lost their value because so many people have come in and added to the lands that are presently being irrigated and taxing our water supplies to the point that on many years we are short on irrigation water.

I would like to read just briefly some of the advantages of one of our sister projects which I feel is very typical of not only the East Bench project but to many other projects throughout the State, that would be benefited on a very similar condition.

That is a study of the lower Yellowstone project by the Bureau of Reclamation near Sidney. The irrigated land of the lower Yellowstone project out-produces adjacent nonirrigated land by about six times. Project-irrigated land values are 12 times the value of grazing land, and 4 times the value of dry cropland, the more intensive use of resources and concentration of population both brought about by irrigation on this project have improved community development through the expanding hotel and motel facilities for the convenience of travelers, construction of a good hospital and better health facilities, and the erection of new and better schools. Retail sales are four times as great in Richland County, Mont., in which two-thirds of the project is located as in the nearby nonirrigated county, an area of equal size. The lower Yellowstone project has increased local

employment in business and professions twentyfold. Personal income in the area or in the integrated area is three times greater than in the nearby county of equal size. Residents of the irrigated area enjoy a higher level of living than in the comparative area and pay one-third less non-Federal taxes per capita because of the much higher tax base provided by the agricultural economy. Federal tax revenues from the project area since 1940 alone equal nearly twice the Federal cost of project construction.

Merchandise shipped into the area comes from 32 States. The history of this project has been repeated, of course, over and over elsewhere, all through the West and will be repeated again and again with the construction of each new irrigation project.

I submit a more complete statement for the record, Mr. Chairman, and thank you.

The CHAIRMAN. Thank you very much, Mr. Taylor, for a good statement.

(The prepared statement follows:)

STATEMENT OF DEMAR TAYLOR, DILLON, MONT.

NEED FOR IRRIGATION IN MONTANA

The State of Montana is an area of deficient precipitation subject to climatic extremes where irrigation is necessary to stabilize agricultural production over a long period. Early irrigation, in a large part, came about through private enterprise and the investment of private capital. Subsequent to 1905 the Bureau of Reclamation substantially increased the irrigated area in Montana. More recently, the State water board has made important contributions to the development of irrigation in the State. Nevertheless, only a minor portion of the area suitable for irrigation in Montana has been developed up to the present time. The simple and least costly storage development projects have all been developed. Natural streamflows throughout the State are overappropriated and storage facilities required for further development involve construction costs beyond the ability of private enterprise and State agencies to finance.

The need for comprehensive development of Montana lands suitable for irrigation is significantly evidenced by crop yields fluctuating with climatic variations, by consequent unstabilized farm income and dependent enterprises, and by a depressed population. Development of irrigation possibilities throughout the State will permit diversification of farm crops, more intensive use of these irrigable lands, and thus will increase and stabilize the State's capacity for agricultural production. Dryland farm operations in Montana are pretty much limited to the production of wheat. More irrigation would remove this dependence on a one-crop farm operation, and at the same time contribute to solving a surplus crop situation. Comprehensive resource development will broaden the State's tax base and will place this State in a more favorable competitive position to meet the demands for food and fiber imposed by an expanding national population.

In the State of Montana only 2 percent of the gross land area, or about 13 percent of all the cropland, is irrigated. During recent years this irrigated 13 percent produced about 30 percent of the State's total crop value. During that most severe drought year of 1936, it has been estimated that the irrigated 13 percent produced 63 percent of the State's crop value in that year. These figures demonstrate the stabilizing effect of irrigation on the economy of this State and also support the need for increasing the irrigated acreage wherever possible in order to insure future prosperity and economic stability. It is now predicted that the population of the Nation will increase by 60 million within the next 18 years. A great portion of this population increase must surge westward in search of settlement opportunities. The demand for additional food and fiber imposed by this exploding population will eliminate any crop surpluses within a short term. Investigation and planning of all resource development possibilities should move forward rapidly in order to keep pace with the anticipated need and demand. Comprehensive irrigation development must be accelerated to make a maximum contribution to the increased agricultural production that will be required because of the population increase.

The value of irrigation to this State can best be demonstrated by the positive accomplishments of a particular project. For instance, a recent study made by the Bureau of Reclamation on the lower Yellowstone project, near Sidney, Mont., shows the following:

(1) The irrigated land of the lower Yellowstone project outproduces adjacent nonirrigated land by about six times.

(2) Project irrigated land values are 12 times the value of grazing land and 4 times the value of dry cropland.

(3) The more intensive use of resources and the concentration of population, both brought about by irrigation on this project, have improved community development through expanding hotel and motel facilities for the convenience of travelers, construction of a good hospital and better health facilities, and the erection of new and better schools.

(4) Retail sales are four times as great in Richland County, Mont., in which two-thirds of the project is located, as in the nearby nonirrigated county, an area of equal size.

(5) The lower Yellowstone project has increased local employment in business and professions twentyfold.

(6) Personal income in the irrigated area is three times greater than in the nearby county of equal size.

(7) Residents of the irrigated area enjoy a higher level of living than in the comparative area and pay one-third less non-Federal taxes per capita because of the much higher tax base provided by the agricultural economy. Federal tax revenues from the project area since 1940 alone equal nearly twice the Federal cost of project construction.

(8) The project is responsible for providing employment to many persons residing in other parts of the country who are engaged in the manufacturing, transportation, selling, and servicing of project-produced commodities, and in those industries that produce goods and services to meet the needs of project residents such as farm machinery, agricultural equipment, furniture, clothing, etc.

(9) Merchandise shipped into the area comes from 32 States.

The history of this project has been repeated, of course, over and over elsewhere all through the West and will be repeated again and again with the construction of each new irrigation project.

Additional flood-control storage capacity is also needed throughout the State. Rivers of this State characteristically rise out of their banks during the spring flood season and cause damage to farmlands, irrigation facilities, communication facilities, transportation, and other improvements adjacent to the rivers. Floods have recurrently also caused damage to municipalities. The construction of additional reservoirs for irrigation would, incidently, reduce and minimize flood hazards and damages.

The installation of power facilities where feasible in the State is also needed to insure the availability of power for a potentially expanding power market. Low-cost power is needed to provide for irrigation pumping in the State. The trend toward increased consumption of electrical energy in urban homes, on the farm, and for industry will accelerate with anticipated population increases. Certainly the installation of power-generation facilities should accompany irrigation development wherever possible to help meet these demands, and also to provide repayment assistance.

In the last few years demands of the people have stimulated a tremendous increase in recreational uses of project reservoirs and lands. Here in Montana the State fish and game department and division of parks have made notable contributions in meeting this increased use. The rapid expansion of recreational uses, however, is beyond the ability of these agencies to keep abreast of with their limited funds and other responsibilities. In view of the fact that people from all over the country make use of these recreational opportunities, it is my feeling that provision for such use, at least on a minimum basis, is a national responsibility and not properly a reimbursable project function or expense. The responsibility of administration could be handled by State or local agencies if they could have this helping hand at the outset.

It is my firm belief that in Montana, as well as elsewhere in the West, flood control and power generation are inevitable partners with irrigation. To these purposes must now also be added the requirement of providing, at the very least, minimum recreation and fish and wildlife opportunities. The prospect of a much greater population with more leisure time should be recognized now.

The CHAIRMAN. At the request of Senator Murray there will be included in the record a statement by Mr. Clifton Merritt, of the Flathead County Wildlife Association, a statement by Mr. Dennis Dellwo, from the Flathead Irrigation District and a statement by Harold Hagen, president of the Montana Reclamation Association.

(The statements referred to follow:)

STATEMENT OF CLIFTON R. MERRITT, FLATHEAD COUNTY WILDLIFE ASSOCIATION

Gentlemen, as an individual citizen who is interested professionally in the promotion and stabilization of employment, I cannot overlook submitting for your hearing in Missoula on October 12 a few observations on the need in Montana for comprehensive water resource planning and development.

Water is perhaps Montana's most important natural resource and offers the Treasure State its greatest opportunity for expanded and sustained industry. Yet if developed unilaterally its optimum use in making possible industry and jobs, as well as providing for the recreational needs of the people, will never be realized. Our water resource cannot properly be considered, managed, or developed separately from our other basic resources—soil, timber, grass, scenery, and wildlife.

Past development has not always recognized this fact, and the industrial, economical, and social welfare of the people of today and tomorrow has been adversely affected by such shortsightedness. Mistakes of the past must not be repeated. Industry itself has not by any means been solely responsible. Conservation agencies were created to administer our natural resources for the greatest benefit to the people in the long run. However, even most of these agencies have to a noticeable extent lost sight of the need for coordination, forceful leadership, and public understanding and support in the common cause that will determine whether this Nation through its sustained resources will continue to enjoy its freedom or, upon soon exhausting its natural assets, will become the slave of a threatening foreign power.

Thus, one conservation agency practices wholesale mayhem on the country's waterfowl and water table by the unwise drainage of land at taxpayers' expense to grow unneeded crops, while, at the same time, it neglects the great task of teaching better use of lands now in cultivation. Other agencies have pushed waterpower development projects with little or no regard or planning for wildlife, wilderness, and other quality recreational values. Still other agencies have promoted unilateral action. And each has been jealously and blindly unwilling voluntarily to coordinate its activities for the greatest benefit to the people in the long run. Contradiction has been piled upon contradiction until conservation, twisted and tortured, has become a confused subject to most citizens, a government-sponsored scheme for the exploitation of one resource at the expense of needless destruction of others, instead of becoming, as intended, the guiding light to sustained abundance of all resources.

At the bottom of all this, of course, is the lack of a comprehensive water and land-use planning program which provides for multiple use, but with primary and secondary uses, to which all government agencies, private interests, and the public must subscribe.

It is my belief that America cannot permanently maintain its enviable position of strength, its industry, employment, and national defense—all of which stem from the wealth of its natural resources—without coordinated plans for land and water use and the enactment of legislation embodying the principles of S. 2549, the Resources and Conservation Act of 1960, to see that such comprehensive plans are carried out.

---

STATEMENT OF DENNIS DELLWO, SECRETARY, FLATHEAD IRRIGATION DISTRICT

By way of introduction: I have, for 30 years, been the secretary and one of the commissioners of the Flathead Irrigation District, which district covers lands of the Flathead Indian irrigation project. Our project covers 140 acres, and is basically a very sound project. Our water supply is adequate, and our per acre production is good. We of the Flathead have little to complain of.

A movement to set up a water resource development policy under which water might become looked upon as a purely national resource is fraught with much danger. It is likely that there would be a tendency to disregard long-established

procedures which grew up in the Old West, and which, through their general acceptance and recognition, developed the sanctity of the common law. This is a danger to upriver areas which had better not be overlooked.

Our representation in Congress is a small minority compared with the two-score or thereabouts from the downstream States. The utmost in watchfulness and energetic protection of upstream needs and rights must be exercised.

It seems that the right of upstream areas to divert water from the headwaters of our rivers for domestic requirements and for irrigation should be definitely setablished as prior to all other claimed rights. There should be no remonstrance against such high priority for those two uses of water. I had it from a power engineer of high repute 30 years ago that development of power on our larger streams did not suffer loss through diversions from upper tributaries for domestic use or for irrigation. His contention was, water so diverted served to level the runoff, the soil serving as a reservoir.

Then we must always insist that the "water code of the Old West" be strictly adhered to. Sneak diversions have long since been outlawed. For instance, our irrigation service engineers have always followed the requirements of State law with respect to the posting of notices of proposed diversions, and the filing of the same with the proper authorities. Our project engineer regularly each 3 years went through the formal process of posting what we used to call the Newell Tunnel power site, now Kerr Dam site. The same for the proposed tunnel diversion of Tourquoise Basin high in the Mission Range. Regularly a couple of huskies climbed higher and did the required posting.

The faithful posting of the Newell site, together with other acts of appropriation, paid off. As a result thereof, our project made a very advantageous deal with the Montana Power Co. through the exchange of our equities in the site for certain amounts of power for our then proposed rural power system. Of course, only a very few of us foresaw then what rural electrification would do for us. Our project power system is now delivering power to the remotest farmstead at the same rates paid by our town customers, with the householder in both areas getting a special rate. Notwithstanding our low rates, our net revenues have been sufficient each year to meet the annual construction assessment against both the power and the irrigation systems of the project.

We must not permit our stable economic structure to be undermined for someone else's benefit. Uncle Sam should help us in this since he owns half of our State.

---

STATEMENT OF HAROLD HAGEN, PRESIDENT, MONTANA RECLAMATION ASSOCIATION

My name is Harold Hagen. I am a farmer living at Stevensville, and I am president of the Montana Reclamation Association. The Montana Reclamation Association appreciates this opportunity to present the views of our association and respectfully submit the following statement for your consideration.

This organization was founded 16 years ago and is dedicated to plan, promote, and consummate a comprehensive system of land and water development and utilization for the entire State of Montana.

The principles which have guided the action of the organization in regard to water and resource development were best expressed in testimony given at a hearing called by the Corps of Engineers in 1948. The position of the Montana Reclamation Association in regard to water development was stated at that time by President O. P. Balgord, and has continued to be the basic policy of the organization to this time. Senator Balgord said, "It is to be expected that any plan for resources development will give full recognition to and protection of western Montana's needs. Such a plan, if it receives the support of Montana citizens, must provide for the preservation and development of all possible irrigated and cultivated land in order that the area may have a base for further development of its natural resources.

"The Montana Reclamation Association will protest vigorously any program that will reduce the number of acres of land that can now be irrigated in the State of Montana.

"The State is a producer of raw materials. Not more than 5 percent of its land area is capable of being irrigated. Under such circumstances, any plan for water use development in the State must be adjusted to the following policy:

"1. That every acre and fraction of an acre with soil suitable for producing crops must be preserved for this purpose.

"2. That Montana's water resources must be safeguarded for agricultural purposes before water can be diverted for other uses. This means that storages should be located where the water can be most effectively and economically brought on the land. It is much easier to transport electric power long distances to points of consumption than it is to transport water for irrigation. It should make little difference in use of storage water for regulation of stream flow, where the storages are located.

"3. Another factor in Montana's economy is its scenic attractions. Montanans insist that improvements placed within these borders will not desecrate nor destroy for all time large segments of this scenery. It may take considerable effort to find the method, but Montana's citizens will insist upon the protection of its major scenic assets at the same time it urges full development of its streams.

"Summarizing, the Montana Reclamation Association urges the Federal agencies and State officials responsible for planning the greatest utilization of the State's water and land resources to prepare jointly an integrated plan that will preserve and expand the economy of the area.

"This plan should give preference for the preservation of land that is useful for agricultural purposes."

In Montana we have, relatively speaking, an abundance of water, and we recognize it to be one of our most precious resources. We sincerely hope that in the development of that resource we will not inundate the fertile soil of our valleys and become merely a vast storage area for water to be used for beneficial purposes downstream.

Our Montana Reclamation Association supports aggressive action in the promotion of sound irrigation proposals and positive opposition to proposals deemed inimical to such development.

We sincerely hope the efforts on your select committee will establish a policy that will recognize our Montana water laws and provide their preservation for future beneficial use of our water resources.

The CHAIRMAN. Mr. Lief Erickson, Committee for Paradise Dam.

I am sure that Mr. Lief Erickson is a living character and not a historical one and that Paradise Dam is one in this area and not one that you might think of by hearing the name.

## STATEMENT OF EUGENE H. MAHONEY, COMMITTEE ON PARADISE DAM

Mr. MAHONEY. Mr. Chairman, Congressman Metcalf, first, I would like to clear the record. My name is not Lief Erickson. I am merely pinchhitting for Lief. Because of a trial in court he could not be here today. My name is Eugene Mahoney. I live in Thompson Falls, Montana, on the banks of the Clark Fork River.

I am a member of the State senate and represent Sanderson County in that body and prior to that time I represented them in three sessions in the house of representatives.

We have here, Mr. Chairman, two statements for the record, copies for all members of the committee.

My purpose here today is merely to summarize what is prepared in these rather extensive briefs by the Paradise Dam Committee.

I might say that the Committee for Paradise Dam is an organization composed of 856 individuals whose sole purpose is to work for the maximum feasible development of the water resources of this area and the Nation in the interest of its citizens throughout the entire Nation and State. We have the support of the Montana Farmers Union, an organization of some 16,000 farm families, and of the Montana AFL–CIO, whose member unions represent over 25,000 individual members. Both of these organizations have backed our stand by resolutions and have given us financial support.

The testimony which was presented to you has been reviewed by our executive committee and I am sure that it represents the thinking of the members of the entire committee.

We have done this rather than parade a group of witnesses before this busy committee and merely wish to present a documented brief to this committee for their further consideration and study.

We wish to express our thanks to the committee for the opportunity to appear and to express our views in this very important matter, not only to the State of Montana, but to the entire Nation.

I would like to briefly summarize what was contained in these two documents that I presented to the committee, if I may, in the way of conclusion.

It is our feeling that the Federal Government is the only agent of the people capable of planning and building projects at multipurpose sites on the Nation's rivers to obtain maximum multipurpose benefits.

I might state that two of the largest of the three largest multipurpose sites are located in Sanders County, the one at Paradise and the one at Knowles, which is an alternative to Paradise and of course the Libby Dam which has been authorized but not yet started by construction.

In determining the feasibility of any multipurpose dam we urge the use of a 100-year economic life as the basis for benefit-cost ratio. Actually, 100 years is too short.

The Secretary of the Army Brucker told the inland waterways meeting, and I quote:

**The dams we built are almost as permanent as the mountains themselves.**

I hope he was not thinking of that particular mountain in the Madison Valley when he made that statement.

We urge that the Federal operation of the optimum multipurpose use, the water of the Nation's rivers belong to all of the people. No one should be permitted to waste it to the detriment of other users.

We urge the Congress in the national interest to enact legislation prohibiting projects which would preclude full development.

We urge authorization for a Federal project in the Paradise-Knowles region. Only when there is definite authorization will it be possible to predict the amounts of water that will be required for various uses. Without this authorization Montana is likely to drag along and in what has often been called its colonial status, its rate of growth the slowest in the Nation as Time magazine just recently reported.

The CHAIRMAN. Time magazine is not the most highly respected in the opinion of at least one member of this committee.

Mr. MAHONEY. That I will agree with the Senator on 100 percent. But I would assume, however, that their information is somewhat accurate.

The CHAIRMAN. That is an assumption I am sure they are glad to have indulged in but one that my silence on the subject does not necessarily endorse.

Mr. MAHONEY. We also believe that the rate of growth may be accelerated.

We urge an amendment to the Bonneville Power Act to permit the Bonneville Administration to issue revenue bonds to finance these

self-liquidating projects, a bill similar to the one as introduced by Senator Neuberger and presently existing for this type of legislation in the TVA self-financing bill which was passed this last session of the Congress.

Development of our water resources is an investment to promote and produce growth. We do not believe it is an item of current expense. The Nation's capital assets should be shown in a separate account, a capital budget, not lumped with ordinary expenses; permitting self-liquidating projects to be financed by revenue bonds would assist in making this distinction and in making it readily understandable to the public. It would permit orderly scheduling and building according to engineering timetables.

Time, we believe, is very important. We respectfully urge an action by the next session of Congress that the Nation may have the base of productive capacity for the long competition ahead between the free world and the Communist world, that it may keep pace with our exploding population, maintain and improve our study of living, that Montana's rate of growth may increase to be the fastest in the Nation and that we may make use of the bountiful resources bestowed upon the Treasure State and catch up with the rest of the Nation for the bright future that is possible.

I am sure it is elementary that there is no one who fails to agree that water is one of our most precious and vital resources. How we use that water is going to depend on our future growth, not only in Montana but in the United States.

We in Montana believe, particularly in western Montana we believe, that there is plenty of room for growth, for recreation, for industrialization, and for use.

I believe that the Federal Government is the only group that is financially and economically in a position to build multipurpose dams. I speak from experience. In my county just west of the Thompson Falls in the past 5 years two private power dams have been constructed, one just a quarter of a mile outside of Montana into Idaho. The other one at Noxon, Mont., in my county. Both of these dams were built by the Washington Water Power Co. The power from these dams leaves Montana. There is not one bit of power used from either of these projects within the State of Montana, although on the one we store most of the water that is backed up into Montana from Idaho, and on the other we have a 34-mile lake. There are power lines that leave Montana and we receive none of the power produced there.

We believe that we have in western Montana the opportunity to grow industrially, to offer to the people of the State and the Nation the best recreational facilities available but that in order to do this we must use our resources wisely, carefully, and intelligently and in order to do that there must be some comprehensive overall plan so that we won't be chopping up our rivers and our resources and forbidding in the future without great expense the development, the proper development of our own national resources.

I read the statement prepared by Fred Buck, the State engineer, as reported in the press, and I believe that he is inclined to agree with some of these ideas because in his statement, if I read it correctly in the press, he says there must be adequate power for the use of the peo-

ple of Montana. In making that statement I think he must have realized that the only way you can effectively put in a reservation of power is on a federally-built and controlled project.

I believe that we must develop our multipurpose sites due to the fact that each year millions of acres are being taken out of production so far as our farm produce is concerned and with our exploding population certainly we must make some provision in the future to feed these people. The surpluses that we now have may not be surpluses but we may be faced with the other end of the pendulum if we do not adequately and intelligently prepare for the future for the State and for the Nation.

I wish to thank the members of this committee very much for the opportunity.

The CHAIRMAN. The statement referred to by Senator Mahoney will be received for the record, one by Mrs. Frances Logan, secretary to the Committee for Paradise Dam.

Mr. MAHONEY. Mr. Chairman, I would like to present a compilation of the water resources conference that was held here at the university under the auspices of the law school, in my statement.

The CHAIRMAN. I believe that has been submitted to the committee.

Mr. MAHONEY. Thank you.

(The statements referred to follow:)

STATEMENT OF FRANCES LOGAN, SECRETARY, COMMITTEE FOR PARADISE DAM

Senator Kerr, Senator Murray, members of the committee, my name is Frances Logan. I am a ranch wife living near Charlo on land my husband homesteaded. I am appearing as secretary of the Committee for Paradise Dam, an organization of 846 individual paid members, whose sole purpose is to work for maximum feasible development of the water resources of this area and the Nation, in the interest of its citizens to whom the rivers belong.

We have the support of the Montana Farmers Union, an organization of 16,000 farm families, and of the Montana AFL–CIO whose member unions represent over 25,000 individual members. Both organizations have backed our stand by resolutions and have contributed financial support.

This testimony was reviewed by our executive committee on October 4, and I was instructed to present it.

We have assumed that your busy committee would not have the time, or be specially impressed, by a long parade of witnesses. Instead of bringing in many witnesses or a fat volume of separate letters we have combined the ideas of the Committee for Paradise Dam in a single brief. However, if the number of witnesses or separate pieces of paper counts, it will be very easy to produce them for the record.

We wish to express our thanks for being granted this opportunity to appear before your Senate select committee.

THE EXTENT TO WHICH WATER RESOURCES ACTIVITIES IN THE UNITED STATES ARE RELATED TO THE NATIONAL INTEREST

The close relationship between comprehensive water resources development and our national safety and well-being is well known to Members of the Congress. There is a growing awareness among people generally of this relationship, and the need, not only for optimum development of our water resources, but of speeding up our program. Evidence supporting this position is overwhelming. A few items:

The one veto the Congress was able to override during the last session was that of the public works bill containing funds for 67 new starts. Members of Congress recognized the need for them. They knew, too, that their constituents would back them in this action.

The memorandum of the Senate Interior Committee, for which you, Senator Murray, should be given full credit, relationships of river and related water resources of United States, Soviet Russia, and (Red) China, showed the necessity of accelerating the development of our river resources if we are to retain our position in the struggle between the free world and the Communist bloc.

The visit of Mr. Khrushchev, his arrogant boasts that Russia would overtake and surpass this country in economic production, brought home to the general public with shocking force, as nothing else could have done, the absolute necessity for this country to increase its productivity and step up its rate of growth.

In March of this year Senator Fulbright, chairman of the Foreign Relations Committee, said that Russia's gross national product had increased 8 percent a year since 1955; that of the United States only a little more than 1 percent (exhibit 1). Just to keep pace with our expanding population the United States must increase its gross national product to the longtime national average of 3 percent. To grow, it must be above that.

Speaking at West Texas College on September 26, Senator Johnson said: "The talk we are hearing now of total disarmament is the first cannonade in the declaration of total competition from the Communist world * * *. Communism versus freedom is not an issue to be settled, but a competition to be won" (exhibit 2).

To win this competition we must have power for our factories and water, which is used in larger quantity than all other industrial materials.[1]

Fifty years ago President Theodore Roosevelt said, in opening the first Governors' conference:

"* * * it is safe to say that the prosperity of our people depends directly on the energy and intelligence with which our natural resources are used. It is equally clear that these resources are the final basis of the national power and perpetuity" (exhibit 3 at p. 5).

Our present President knows this, when he is not focusing exclusively on balancing the budget, a budget which lists such self-liquidating national assets as multipurpose dams only as items in the public debt. In his state of the Union message of 1957, at page 4, he said:

"I would like to make special mention of programs for making the best uses of water, rapidly becoming our most precious natural resource.

"* * * the domestic and industrial demands for water grow far more rapidly than does our population."

Senator Mansfield is quoted as having said, in introducing the resolution creating your Senate select committee:

"Today we use water at the rate of about 240 billion gallons a day. By 1975 the rate of use will be about 350 billion gallons a day. There is not under construction or planned for construction by public or private agencies, combined, water resource projects that will provide daily 350 billion gallons of water of acceptable quality" (exhibit 4A).

Lauren W. Grayson, then vice president, now president of the American Water Works Association, said in June of this year:

"In 25 years our water needs may well be 270 percent of what they are today."

He was quoted as saying that about $20 billion must be spent on water facilities (exhibit 4B).

Your own statement, Senator Murray, in introducing your Resources and Conservation Act of 1960, is even stronger. You said:

"* * * the Department of Commerce, in a recent report, advises that Federal water resources expenditures of at least $50 billion are needed in the next 15 years."

In November 1958 Floyd E. Dominy, then associate, now Commissioner of the Bureau of Reclamation, said in an address before the National Reclamation Association:

"In spite of our progress, some 15 percent of the Nation's people endure water restrictions. A new emphasis—urgent and demanding—confronts us in the need for wise use and conservation of our present and available water supplies * * *.

"Now the cry over the Nation is water * * * more water" (exhibit 5A).

There can be no question that water resource development is related to the national interest. We believe full utilization of our water resources is essential to our national security, national welfare, and to insure our future growth.

---

[1] "Water Facts," U.S. Department of Agriculture, Soil Conservation Service PA-337, August 1957.

THE EXTENT AND CHARACTER OF WATER RESOURCES ACTIVITIES, BOTH GOVERNMENTAL AND NONGOVERNMENTAL, THAT CAN BE EXPECTED TO BE REQUIRED

Turning to the second question on which you have asked testimony, the committee for Paradise Dam believes Montana's future development is so dependent upon congressional action that no reliable statement can be made as to the amount of water required for various purposes until major national policies have been determined.

That does not mean we want to leave everything to the Federal Government. Efforts to attract industry are being carried on all over the State. That these efforts are succeeding to a degree is attested by the fact that the Bureau of Labor Statistics reports building permits for Montana in 1957 for 49 factories costing $1.9 million. In 1958 permits were granted for 39 facories costing $1.1 million (exhibit 6A).

Another indication—one single issue of the Great Falls Tribune, that of September 11, carried two stories about industrial development—a new factory, and plant expansion by an existing industry, right here in Missoula (exhibits 6B and C). And, of course, everyone is delighted with the announcement that a steel mill will be built in Anaconda.

But are we growing fast enough? Time, in its issue of September 28, says at page 28 that Montana's growth rate is "the slowest in the Nation." Will it increase? (Exhibit 7.)

That will depend on the amounts of water and power that become available to encourage growth. What Congress does, or fails to do, in the matter of water resource development, will be the decisive factor. May I mention three of the many areas for congressional action?

*Irrigation*

Two million acres of land are being withdrawn from agriculture annually in the United States by the growth of cities and suburbs, industrial development, building of airports, and highway construction. Much of this is rich, flat farmland (exhibit 5B).

Because of population growth the amount of food we produce will soon be insufficient. New lands must be developed to replace areas covered by concrete and to feed millions of additional people. Most arable land in the East is already being farmed. The new lands, of necessity, will be largely in the Western States. The kinds of food needed are not those grown on dry land, therefore new irrigation projects will be necessary. They must be planned as part of multipurpose river basin development. Past experience has shown that revenue from power is required to help pay the cost of construction of irrigation projects, and that multipurpose dams make possible many benefits at minimum cost of each.

Where will these projects be located?

The Columbia Basin is a logical area. The Columbia carries more water than any river in the United States with the sole exception of the Mississippi. Its flow equals five Missouris or nine Colorados. We hope a new project will be located in western Montana, specifically on the Clark Fork. The Bureau of Reclamation has stated the Clark Fork Basin has 321,400 acres in Montana "worthy of consideration for possible irrigation development."[2]

Western Montana also contains two of the three largest remaining water storage sites in the entire Columbia Basin, Libby and Paradise. Even the smaller alternative to Paradise, Knowles, would still rank third.[3]

Whether these sites are developed or not are developed is up to Congress. We have already been given a preview of what would happen if they are not developed by the Federal Government. A spokesman for the Montana Power Co. stated at a hearing by the Corps of Engineers held in Missoula on October 20, 1957:

"Montana Power is prepared to proceed with the construction of the Buffalo Rapids project whenever it is determined that Paradise Dam will not be built."[4]

This project would develop only one-sixth the active storage of Paradise, or a little over one-fourth the storage of Knowles. Then, at another Engineers' hear-

---

[2] Clark Fork River Basin (above Idaho State Boundary), Bureau of Reclamation, May 1956, p. 15.

[3] Water Resource Development, Columbia River Basin, U.S. Army Engineer, Division North Pacific, June 1958, vol. I, table 49.

[4] Columbia River Review Report; Record of public hearings held at Missoula, Oct. 21, 1957, U.S. Army Engineers, vol. II, p. 715.

ing held on March 9, 1959, the same official stated the company was pepared to apply for license to build Buffalo Rapids dams No. 2 and No. 4. The fact that he proposed two dams means they would of necessity be low, run-of-river dams with no storage—for irrigation or any other purpose. Either proposal would preclude construction of a large storage project which could furnish water for irrigation.

It is apparent, then, that whether or not the water of the Clark Fork will be regulated for maximum, multipurpose use, including irrigation, depends on congressional action.

At this point it seems appropriate to quote President Eisenhower again. On October 15, 1956, when he pressed the key to start construction of Glen Canyon Dam, he said, in part:

"Today we are marking the beginning of the actual work on this great storage project. These dams are much more than just big masonry projects. We are, first of all, conserving one of our most precious resources: water, to use it where and when it is needed.

"* * * We will have additional hydroelectric power for the expanding economy of the region; and we will have all sorts of benefits in the added jobs and industry that will spring up from these structures.

"* * * It happens to be one of those that is too far reaching in its effect, too gigantic in size, to be handled by local authorities and local resources. And so the Government steps in, glad to do it." [5]

*Population*

Turning now to population and its relationship to water. Between 1920 and 1950, population growth in Montana did not keep pace with the national pattern. During the period from 1950 to 1955 Montana's population increased at approximately the same rate as that of the country as a whole.[6] Is it safe to project a similar rate of growth for the future of Montana as for the country at large? We believe it is not.

With the large expected increase in population for the United States the additional millions must find some place to live. There is already bad overcrowding in many of our metropolitan areas. Montana is sparsely populated in comparison with much of the country. Though fourth largest in size, it is 41st in population.[6] We have plenty of room.

"One-fourth the population today is troubled with water shortage, poor water, or both. And the prospects are for even more difficulty in the future."

So says the bulletin, Water Facts, cited earlier.

Western Montana is blessed with abundant clean water from the snowpack on our mountains. Also we think Montana is a good place to live. Western Montana might well experience a population growth far greater than the national average if—and it is a big if—if there are jobs available. At present many of our young people leave the State to find work. Unfortunately this is particularly true of our high school and college graduates (exhibit 8).

*Industry*

What factors will determine the number of new jobs that will be created in the coming decades?

We know that the proportion of the population employed in agriculture is declining in Montana, as it is in the Nation. We must therefore depend on jobs in basic industry, and the jobs in supporting industry and service trades that basic industry itself creates. The kinds of industry likely to locate here are those that process our raw materials, industries which use large amounts of water the year around, cheap power or both. A paper given at Montana Law School conference on water in June 1957, by Bernard J. Goldhammer, Chief, Customer Service and Power Requirements, of the Bonneville Power Administration, goes into this question in considerable detail.[7]

In the same volume the relationships between population, industrial growth and water in Montana are so well presented by Perry F. Roys, former director of the Montana State Planning Board that if the staff of your committee has not already seen it I should like to present a copy of it, if I may be permitted to do so, rather than to go into the subject at greater length now.

---

[5] White House news release by James C. Hagerty, Oct. 15, 1956.
[6] "The Montana Almanac, 1959–60," pp. 159–160.
[7] "High Dams and Upstream Storage," Montana University Press.

*Power*

Will regulated water and the cheap power it creates be available?

The potential is here in western Montana. The Federal Power Commission, in its brochure, "Hydroelectric Power Resources of the United States, Developed and Undeveloped, 1957," says that 40 percent of the undeveloped hydropower of the country is in the north Pacific drainage. The bulk of it is in the Columbia River basin—31.5 million kilowatts at 392 sites. In the Clark Fork alone the potential is listed as 2.5 million kilowatts.[8] (This figure does not include Paradise or Knowles but the smallest alternative, Buffalo Rapids.)

By whom will this power be developed?

*Municipal development*

It is generally accepted, I believe, that people should do as much for themselves, as close to home, as they can. What chance is there for local development?

Montana is one of two States, the other being Hawaii, that has no municipal power,[9] so harnessing of our rivers by cities even for relatively small projects appears to be out of the picture.

*State*

Those who witnessed the difficulties the last legislature encountered in financing the State's current operations are not likely to suggest the State as a source of credit for financing development of hydropower, at least not within the foreseeable future.

*Investor-owned development*

What are the prospects for development by investor-owned utilities?

Under the heading of "Irrigation" I indicated the degree of underdevelopment of the Paradise reach of the Clark Fork-Flathead tributary proposed by Montana Power Co.: one small single purpose dam to generate a fraction of the hydropotential of the river, or its more recent proposal of two even smaller dams.

An example of what is now happening in Montana under investor-owned utility development is Noxon Rapids. A recent lead article in a Sanders County paper boasted that the county would soon be the most "powerful" in the State. What it did not mention was the fact that not a kilowatt of that power would be used in Montana. It is all to be transmitted out of the State. It will not attract a single industry. The only permanent jobs it will create here will be for the maintenance staff at the dam.

The article gloated over the fact that the power company would pay taxes to the county, whereas Federal Hungry Horse pays none.[10] What it did not mention is the fact that the taxes paid by both Washington Water Power for Noxon Rapids and Montana Power Co. for Thompson Falls installations, added together, amounted in 1958 to about one-third the taxes paid to Flathead County by Anaconda Aluminum Co. attracted to the area by abundant, low-cost power from Hungry Horse (exhibit 9). Further, Anaconda Aluminum uses only one-third the power of Hungry Horse. Another third goes to Victor Chemical located in Silver Bow County where it pay taxes.

The proposal of Montana Power Co. to underdevelop the Paradise reach, the fact that a power company has the constitutional right to market its power wherever it pleases, and that no authority can require it to sell any of its power in Montana, indicate what is likely to happen if development of Montana's water resource is left to power companies.

*Columbia Interstate Compact Commission*

Because certain individuals and groups have urged that matters relating to water in the Columbia River Basin be turned over to the Columbia Interstate Compact Commission, it should be mentioned. It should be noted that, though it was set up in 1952, it has not yet reached agreement. The last press release about it in our file, dated September 16, 1959, states that it has now given up hope of reaching agreement upon a compact as a whole, and is changing its tactics to a more modest program, subject by subject. (Exhibit 10.)

---

[8] "Hydroelectric Power Resources of the United States, Developed and Undeveloped," p. 5.

[9] McGraw-Hill, "Directory of Electric Utilities," 1958.

[10] The fact that power companies pay no taxes, that they merely collect them from ratepayers is treated in other testimony.

Another fact of importance is that as it is now set up, it is not an action group. It has neither authority nor financial capability to undertake actual development. In testimony before the Senate Public Works Committee during hearings on S. 3114 in May of 1958 Governor Holmes said:

"But even the most ardent advocates of interstate compacts are slow to suggest their extension to the establishment of so-called action agencies with authority to construct and operate the types of projects characteristically developed by the Federal Government in the past. A number of our citizens in the Columbia Valley, for example, have been enamored of this idea; but, after 8 years of negotiations in which we at various times have considered this possibility, we only this last week abandoned all hope of it." [11]

As I recall, Senator Murray, you made same pretty forceful remarks when the proposal was made in 1957, that it become an action group and take over Bonneville Power Administration.

I think it is worth mentioning that some groups which have advocated development by the Interstate Compact Commission are the same ones which shout, "Montana water for Montanans." Yet they have proposed no plan to prevent the water of our rivers from running to waste, unused. They fight Federal development of storage in Montana (exhibit 11) on the ground that it would benefit downstream States. Actually the only way we in Montana can make use of the water of our rivers is to impound and regulate it here, so we can use it here, before letting it flow on where others may also benefit. Their slogan is sheer demagoguery.

One further fact should be noted about interstate compacts. Even should agreement be reached, that does not necessarily settle anything. California and Arizona signed a compact on division of Colorado River water after the building of Hoover Dam. But dispute over the water still goes on. Whenever one party to the compact becomes dissatisfied it takes the other to court to seek modification. Also, interstate compacts must be ratified by Congress.

*Federal multipurpose river development*

There remains the Federal Government, the agent of all the people. President Theodore Roosevelt first enunciated the policy of Federal responsibility for developing our great river basins as units, a task too vast for any lesser agent. I will not take your time to quote his trenchant statements on this subject in messages to the Congress, in speeches and in vetoes, but refer again to the Senate's own memorandum containing Senator Murray's commemorative address which reprints them (exhibit 3). For many years there was bipartisan support in Congress for this policy. Only recently have the parties tended to take sides for and against it.

Every step of the way the policy has been fought by the power companies. There has been no change in that, except perhaps in the increased amount of money being spent on utility propaganda and the remorselessness with which their campaign is being waged, using all of the mass media and every trick devised by those skilled in influencing thought and behavior.

The Committee for Paradise Dam agrees with the policy of Theodore Roosevelt, with the congressional majorities which authorized Bonneville, The Dalles, John Day, McNary, Chief Joseph, Grand Coulee, Hungry Horse and multipurpose projects in other river basins. We agree with the more than two-thirds majorities of both Houses of the 86th Congress in their overriding the veto of the public works bill which includes 67 new starts. We also agree with President Eisenhower when he says the Federal Government "steps in, glad to do it," when a project is "too far reaching in its effects, too gigantic in size, to be handled by local authorities." [5]

*Advantages of Federal development of multipurpose sites*

The advantages of Federal development of multipurpose sites are many. Some of the important ones are:

(1) Power companies are single purpose corporations. They are licensed to earn a profit for their stockholders by generating power. Storage for flood control, irrigation, navigation, pollution control, improvement of wildlife habitat, public recreation programs, which do not earn a return on capital investment, are not functions which they can properly perform. If they are allowed to build dams at multipurpose sites these benefits will be sacrificed. Further, they will in all probability underdevelop the sites, even for the single purpose, power.

---

[5] White House news release by James C. Hagerty, Oct. 15, 1956.

[11] Governor Holmes, hearings before subcommittee of the Committee on Public Works, U.S. Senate, May 21, 22, and 23, and June 5, 1958, at p. 510.

Idaho Power Co.'s underdevelopment of the Hell's Canyon reach of the Snake, and Montana Power Co.'s proposal to spoil the Paradise reach of the Clark Fork-Flathead, are examples of what can be expected.

(2) The Federal Government can produce power at lower cost, and sell it at lower rates, than any other agency. One reason for this is that interest is a large element of cost, and the Government can borrow at a lower rate than any other borrower. Its low cost power stimulates industry much more than does the higher cost power of utility companies, and is anti-inflationary. Far from being "socialistic" as the power companies are trying to brainwash the public into believing, low cost Government power provides a tremendous incentive to free, competitive enterprise.

TVA's record in stimulating private industry is too well known to need elaboration. One item alone, the money spent by consumers for electric appliances, has reached $1,750 million,[12] benefiting manufacturers all over the country. What is perhaps not so well known is that the power companies bordering TVA have themselves been benefited. From 1937 through 1955 "* * * earnings available to the common stockholders of the larger privately owned power companies in the United States were multiplied less than three times, and similar earnings of companies bordering the TVA multiplied six and a half times." (Exhibit 12.)

Since this was written I have come across another reference substantiating the statement that power companies are stimulated, not hurt by the yardstick competition of Federal low-cost power. Electrical World, McGraw-Hill magazine, quoted in Electric Consumers Information Committee Newsletter, October 5, 1959, lists the average increase in net profits of the power industry for the year ended June 30, 1959, as 9.1 percent, the largest increase in utility new income since Electrical World began its sampling. However the boost for the east south central region was 11.1 percent. E.C.I.C.'s Newsletter comments: "It's interesting that the east south central region—encompassing the TVA area—had the greatest profit gain. * * * It shows once again that private power companies closest to TVA have progressed at a faster than average rate, thanks to the incentives they have to follow TVA's lead in efficiency and encouraging greater use of electricity through lower rates."

The stimulus Hungry Horse Dam gave to growth of Flathead County has already been mentioned.

Here is a recent example: On September 2 Hon. David S. King of Utah, speaking in protest against the veto of the public works bill, cited benefits of the Strawberry Reservoir project.

"Let us look at the record of this humble little project, which cost $3⅓ million.

"Forty-four years later we find that it has paid back 80 percent of its initial cost, with interest. In addition, it has made possible the growing of $78½ million worth of crops, which represents 22 times the value of the original investment. Power, municipal water, and recreation associated with the project bring in $½ million per year. Personal incomes directly attributable to this project amount to $18 million per year. Twelve thousand people live on land made livable by this little project, and Federal taxes paid into the Federal Government from income made possible by this project amount to some $4½ million a year, which is more than a million dollars a year in excess of its entire cost" (Exhibit 13).

3. The role of the Government in prevention of monopoly is treated in other testimony.

4. Rates charged for power by Federal projects provide valuable yardsticks by which to measure rates charged by power companies. As evidence I refer to charts I and II in the TVA folder mentioned previously, also to the map showing "State average bills, 250 kilowatt-hour residential service, January 1, 1958, which appears at page III of the Federal Power Commission's "Typical Residential Electrical Bills 1958, Cities of 2,500 Population and More."

*Majority of voters support Federal Government's role in multipurpose resource development*

That the majority of voters in the United States believe the Federal Government has responsibility for, and should plan and carry out programs for development of the Nation's rivers, is indicated by results of the 1958 elections.

1. The people elected a Congress which overrode by a majority of more than two-thirds, the administration's "no new starts" policy.

---

[12] The Progressive, TVA 25th anniversary issue, May 1958, p. 16.

2. Senator Mansfield and Congressman Metcalf, both known to be ardent conservationists, both known to be supporters of Federal multipurpose river development, were elected by unprecedented majorities.

3. In northwestern Montana controversy over a proposed Federal project, the Paradise Dam, was the hottest local issue. Fourteen men who had testified on that issue at an engineers' hearing ran for election. Of the 7 who opposed Federal development, 2 were elected, 5 were defeated. Of the 7 who supported Federal development, all 7 were elected. Attached as exhibit 14 is a letter to our congressional delegation which goes into this point in more detail.

Lest you think this evaluation of the election is biased, or the result of wishful thinking, I quote from U.S. News and World Report, November 7, 1958, page 34, column 1:

"WHAT ELECTION MEANS TO BUSINESS

"Public works on a rising scale will command stronger support than ever in the new Congress. Water projects for the West will get particular attention. Democratic strength from the Western States will increase, and *water development is heavily favored in this area.*" (Emphasis added.)

*Conclusions*

Based upon the foregoing, we conclude that:

1. The Federal Government is the only agent of the people capable of planning, and building projects at the multipurpose sites on the Nation's rivers to obtain maximum multipurpose benefits.

2. In determining feasibility we urge the use of 100 year economic life as the basis for benefit-cost ratio. Actually 100 years is too short. Secretary of the Army Brucker told the Inland Waterways Silver Jubilee meeting: "the dams we build are almost as permanent as the mountains themselves" (Exhibit 15).

3. We urge Federal operation for optimum, multipurpose use. The water of the Nation's rivers belongs to all the people. No one should be permitted to waste it to the detriment of other users.

4. We urge the Congress in the national interest to enact legislation prohibiting projects that would preclude full development.

5. We urge authorization for a Federal project in the Paradise-Knowles reach. Only when there is definite authorization will it be possible to predict the amounts of water that will be required for various uses. Without authorization Montana is likely to drag along in what has often been called its colonial status, its rate of growth the slowest in the Nation.

6. That growth may be assured we have urged authorization. That the rate of growth may be accelerated we urge amendment of the Bonneville Power Act to permit the Bonneville Power Administration to issue revenue bonds to finance these self-liquidating projects. A bill, S. 1927, has already been introduced by Senator Neuberger. Precedent exists in the TVA self-financing bill which was passed in this last session of the Congress.

Development of our water resources is investment to produce growth. It is not an item of current expense. The Nation's capital assets should be shown in a separate account, a capital budget, not lumped with ordinary expenses. Permitting self-liquidating projects to be financed by revenue bonds would assist in making this distinction, and making it readily understandable to the public. It would permit orderly scheduling and building according to engineering timetables.

7. Time is important. We respectfully urge action by the next session of the Congress—

That the Nation may have the base of productive capacity for the long competition ahead between the free world and the Communist world;

That it may keep pace with our exploding population, maintain and improve our standard of living;

That Montana's rate of growth may cease to be the "slowest in the Nation," that we may make use of the bountiful resources bestowed upon the Treasure State, and catch up with the rest of the Nation for the bright future that is possible.

In your efforts to achieve the goal of full resource development and optimal multipurpose use, the vast majority of the people of Montana will support you.

(The exhibits mentioned are on file with the committee.)

The CHAIRMAN. Also a statement by a gentleman who has a characteristic similar to my own, who signs his name but probably remains the only person who can identify it or interpret it.

The Congressman says it is Mr. Harlow, the president of the Committee for Paradise Dam. He attached to his statement a copy of the Federal Power Commission Opinion No. 59 in the matter of Northwestern Electric Co., Pacific Power and Light Co., Portland General Electric Co., Puget Sound Power and Light Co., Washington Water Power Co., docket No. IT–5647, which will be referred to but not placed in the record.

STATEMENT OF MR. HARLOW, PRESIDENT, COMMITTEE FOR PARADISE DAM

LIMITATION OF RIVER DEVELOPMENT BY MONOPOLY

[Part of a statement authorized by the Committee for Paradise Dam, prepared by S. R. Logan; copy of Opinion 59 attached]

Assessment of our water resources and national policy for full development and use must take into account the role of private companies. The basic question that so concerned the conservationists in the days of Theodore Roosevelt and Woodrow Wilson remains, now more urgent than ever: How can the blight of monopoly be avoided?

River development by private monopoly for profit means slow piecemeal partial development, with lasting sacrifice of much of the varied potentialities. It means profit and aggrandizement of the economic and political power of a few instead of self-liquidating Federal projects and the economies of "package" development through multipurpose public dams and transmission lines. Unless private companies are subordinated to comprehensive public development our liberties will suffer further erosion: we lose our freedom in the degree that we lose our rivers to monopoly.

In the light of experience and history, the purpose and methods outlined by conservationists such as Theodore Roosevelt, Wilson, Norris, Borah, Walsh, and McNary now seem more than ever realistic, wise, and necessary. As they foresaw, the following facts and principles have proved most important:

1. Development must not be subordinated to the profit of investors in power companies and increased economic and political power for the officials of monopoly based on priority in the use of the people's rivers.

2. The method of development should prevent and diminish private monopoly. The "preference (antimonopoly) clause" is of key importance

3. Our attempt to legalize power monopoly, called by Theodore Roosevelt "the worst of all," and to regulate it by means of utility commissions has stimulated power company officials to do whatever they think necessary, politically and by propaganda, to enable them to "regulate their regulators." In no other field have monopoly corporations in politics presented such a threatening challenge.

4. So far as monopoly persists in its methods and its efforts to circumvent effective regulation and to prevent or destroy competition it must undergo frequent thorough investigation by means of an expert staff, subpena and the examination of witnesses under oath. Such investigation to bring the record up to date is a necessary part of any national assessment of and comprehensive planning for utilization of our water resources.

Intelligent formulation of national policy and legislation requires that we know as of today how the experiment of giving power companies semigovernmental status, guaranteed profits, and remission of all of their taxes, under the control of public utility commissions, has worked out. This must be reliably known in order that wise legislation to correct defects and abuses or to terminate the experiment in toto may be enacted.

The most recent thorough investigation into expenditures of power companies for political purposes was 19 years ago, by the Federal Power Commission, and it was limited to northwestern power companies. Attached hereto are copies of "Opinion 59" showing the frightening revelations of that inquiry.

Revelations years prior to "Opinion 59" resulted in legislation to protect the public by sharply limiting the power companies. Senator Greening's "The Public Pays" and Leland Olds' "The Conservation Fight" are excellent documentations of the struggle for full development in the public interest despite the opposition of the power companies.

It seems that we must somehow severely discourage the half private half governmental regulated power monopolies from trying to keep themselves on

top by political activity and a gigantic program of deceitful propaganda. In return for their highly privileged status they should be required to concentrate on doing honestly and well the profitable service job entrusted to them. Failing to do that, they should be entirely excluded from river development.

We know, however, that to the extent that protection of the public interest has depended solely upon regulation of monopoly by public utility commissions under present laws the results have been disappointing. Such dependence upon commissions has stimulated officials of the private power utilities, posing as private enterprise, to engage in every type of activity which helps them to circumvent regulation and to acquire for themselves undue influence over business, politics, education, newspapers, and radio and TV programs. We know, too, that they have achieved an alarming degree of success. We know that their methods, as well as their goals, can threaten the health of American democracy.

If the power company officials succeed in preventing additional Federal multipurpose dams and public transmission lines it will be easier for them to weaken and destroy existing competition by municipalties (public bodies) and cooperatives (private companies) by means of legislation and of more compliant administration. If they succeed in substantially reducing public protection to dependence upon public utility commissions only, they will find it easier to have things their way by means of political activity and brainwashing.

Mitigation of monopoly has become an important byproduct of multipurpose Federal dams, public transmission lines, and the preference (antimonoply) clause. The competition that these induce probably provides more effective regulation of monopoly than the public utility commissions afford. Indeed, these yardsticks make the commissions more reliable and effective.

In Montana the general opinion seems to be that power company officials attach much importance to the election of friendly legislators, executives, judges, utility commissioners, and party chairmen.

The State, through its utilities commission, fixes the rate that consumers must pay private power companies (regulated monopolies) or go without electricity. In determining this rate, the State considers all of the taxes paid by the companies one of the necessary expenses of operation, all of which expenses, including political activities, must be repaid to the companies by means of the State-fixed rate; also so included is allowance for a reasonable profit. Although the company officials draw the checks to the taxing bodies, and publicize each payment with great fanfare, they are authorized by the State to charge all of their taxes to their consumers, collect them, and reimburse the companies in full.

Thus the companies are freed from both risk and taxes, and, in effect, an agent of the State, actually collect and funnel taxes to taxing bodies. Because they draw the tax check to the taxing bodies they are able to fool the public into believing that they are genuine taxpaying, risk-taking private enterprise severely burdened by taxes. They even insist that they should be free from the regulation that results from competition, both private and public, which undercuts their monopoly position and makes it more difficult to fool the utility commissions and the public. Should not the State withdraw this power of deception by collecting and disbursing its own taxes?

In Montana the influence of private power monopoly in our economic, political, and social life has increased as it has extended its holdings and operations. It is closely associated with the Anaconda, and the Northern Pacific. Together they have an enormous capacity to reward and punish, to make and break, by giving or withholding patronage, by hiring, firing, promoting and demoting, and otherwise rewarding or punishing. This results from their widespread ownership and influence in banking, farming and grazing, timber and lumbering, manufacturing, mining, oil, electric power, publication, and an astonishing miscellany of hotels and other small businesses. They are well equipped with public relation experts and lobbyists. Their power over the lives of citizens, political parties, and other institutions, is so universally known and feared that many citizens will not take a stand which might be displeasing. Many undertake to curry favor. Only a few accept the challenge of tyranny and rise in bold but peaceful revolt.

To the extent that officials of the eastern-owned power companies succeed in preventing further development of Montana rivers by the people themselves through the Federal Government, they further entrench monopoly and aggravate Montana's colonial dependence. Their Columbia River domain will extend without interruption from below Hungry Horse and Missoula clear into the

State of Washington. Not only will the people's liberties be further curtailed but development of the rivers and of the economy of the State will be retarded and subordinated. Hence Montana's future acutely depends upon the methods whereby the Federal Government seeks to deal with its falling water to meet both the challenge from within and the challenge from abroad.

A logical time schedule of full and economical river development would give western Montana high priority in the location of Federal multipurpose dams, with their great reservoirs.

Montana needs the population and industry which abundant clean water, cheap power, and other benefits from proper development can bring. Conversely, the Nation needs vast Montana for dispersal, from both economic and defense viewpoints. However, the most obvious reason for high priority is the fact that the higher the elevation at the reservoir the more valuable is the project for its many benefits in the entire basin.

But, there are few sites for large multipurpose projects still available on the upper Columbia. As they become occupied for other uses and the power companies grow stronger it is easier to rally opposition. Therefore these companies confuse, delay, and obstruct. They even seek support for their own rival piecemeal nonstorage projects which would infringe on the great storage sites.

Ironically their ability to subvert and prevent development of the peoples' rivers in the peoples' interest is based on free concessions and outright subsidies from the peoples' government.

The CHAIRMAN. Senator Murray was quite anxious that one of the great organizations of Montana, the League of Women Voters, have the opportunity to be heard and I understand that Mrs. M. Y. Foster of that fine organization is here.

Will she come forward?

## STATEMENT OF MRS. M. Y. FOSTER, PRESIDENT, LEAGUE OF WOMEN VOTERS OF MONTANA

Mrs. FOSTER. The purpose of the League of Women Voters to promote political responsibility through informed and active participation in Government is being demonstrated in Montana, Idaho, Washington, and Oregon during their joint study of the Columbia River Basin.

This study is part of a nationwide effort of league members to spell out the meaning of the present position of the League of Women Voters of the United States on water resource—

The support of those national water policies and practices which promote coordinated administration, equitable financing, and regional or river basin planning.

Before beginning the Columbia Basin study, league members of Montana had already made a survey of Montana's water status. The Havre League completed a study of the Missouri Basin. Attention of other leagues in the State is being directed to a similar survey. As yet no study of the Hudson Bay drainage has been made. Some, for the first time, realized that Montana's waters flow through one minor and two major watersheds: To the Pacific, to the Gulf of Mexico, and to the Hudson Bay. They flow through three States to the west, 12 to the east and south, and through Canada to the north. The waters rising in Montana's mountains are shared with many of our country's millions of people.

A full water resource discussion would include the facts concerning ground water, pollution, irrigation, recreation, wildlife, timber, grazing, dams, and fish. Several of these have already been discussed here today. I will attempt to add a bit here and there.

The League of Women Voters of Missoula has been particularly interested in the subject of water. From 1954 through 1956 the agenda carried an item on water resources. It was at this time that a study of the pollution of the Clark Fork was taken up by the local league—thus leading to the present action in support of sewage disposal plant project in the city. The league in Great Falls has also brought the subject to a grassroots level and has wholeheartedly supported the expansion of a water system and a sewage disposal plant.

Unit discussions brought out the fact that a 5-minute shower spends 25 gallons of water. Watering the lawn for 1 hour costs another 300 gallons! Surface water, water tables, and ground water was discussed. It was found that the value of underground water as an undeveloped water source is just being recognized in Montana, with very small use being made of its possibilities. In the Columbia Basin study it was found that ground water resources vary greatly in volume, and that Montana is the only basin State that does not have laws controlling ground water use.

The trapping of beaver in Montana may have given water its first importance, but it was the mining industry which brought the introduction at the first territorial legislature in Bannack of the riparian doctrine; however, the practice of appropriation had become the accepted method among the miners for the determination of the right to use water, so an act borrowed from the statutes of Colorado was enacted by the same legislature (Montana Terr. Session Laws, 1864–65 p. 356). There are no riparian rights in the State of Montana. The case of Anna Mettler on Prickly Pear Creek near Helena in 1921 finally established this fact (*Mettler* v. *Ames Realty Co.*, Montana Reports, 61: 152–71, 1921).

A State official commenting on it remarked, "Not even a fish has any riparian right in Montana.

In effect, two systems of establishing water rights became recognized in Montana; first, by the method of filing prescribed by law; second, by use alone. Both have been and still are judged valid by district courts. Water rights but not water are owned. Appropriation must be for a beneficial use.

The "Water Resource Handbook," published by the League of Women Voters of Montana, states,

> Since 1946 the activities of Federal agencies in the field of water development have been greatly increased within the State, bringing greater awareness of the role that water will play in Montana's future. Legislation for an interstate compact to control water use in the Columbia watershed is being studied. A draft of this legislation failed to pass in the 1959 legislature—there are four references before the International Joint Commission providing for allocation of power and water between Montana, British Columbia, and Alberta. One of these pertains to the watershed diverting to Hudson Bay. Another reference has been agreed to between Montana and Alberta, and legislation approving it was passed by the 1957 legislature. The treaty of 1909 provides a definite formula for the allocation of water of the St. Mary's and Milk Rivers between the United States and Canada.

In 1958, the League of Women Voters of Montana joined the Idaho, Washington, and Oregon leagues in a comprehensive study of the Columbia River Basin. In an effort to be specific and to come closer to home, they published a booklet about the basin, entitled, "The Great River of the West." It is hoped through the facts presented in this pamphlet to find a way through the maze of confusion and come

to a consensus of how in the handling of water resources, coordination on a regional basis can be accomplished.

At the top of page 22 of the pamphlet it says, "There are 13 major agencies distributed among 6 cabinet departments plus the independent Federal Power Commission, that have jurisdiction over various phases of water resource development in the Columbia River Basin."

On the next page is the statement, "Present limited coordination of multipurpose river development in the Columbia River Basin rests with the Columbia Basin Interagency Joint Commission." Proposals for a Columbia Valley Authority have been made. Also, legislation has been introduced to set up a Bonneville power corporation. Objections have been many to both sides. A seven-State compact has also been suggested. Again, conflicts have prevented its adoption. From these excerpts one can see what a complex problem presents itself in the Columbia River Basin alone.

An agreement on equitable financing at the regional level has not as yet been reached—I'm not sure that it can be reached—but the question of who pays and who benefits has been discussed.

In general, benefits from a project that are national in effect or that are not reimbursable such as navigation and flood control, are borne by the Federal Government. Localities bear the cost of purely local benefits such as municipal water supply. Local sharing of irrigation costs and pollution abatement grants, for example, is on the basis of ability to pay; construction of flood control levees may be borne entirely by the Federal Government with the State or local agency paying for operation and maintenance. The entire area of cost allocations for various purposes of Federal or "partnership" projects is fraught with conflicts between Federal agencies, Federal and State agencies, Federal and local agencies, State and local agencies.

The appointment of the Senate Select Committee on Water Resources has shown us the interest in coordination and planning at a Federal level. At its September meeting the National Board of the League of Women Voters went on record as giving support to Senate bill 2549, the bill introduced by Senator Murray which sets up machinery to help solve problems in the natural resource field.

May I again thank you, Senator Murray, for asking the league to participate in the program today.

In closing, I would like to submit to the committee copies of the material gathered by the Columbia Basin Leagues, a statement to be filed for the Columbia River Basin Regional Committee, the Montana League of Woman Voters Handbook, and the Missoula League of Women Voters pamphlet on the subject of "Water Resources."

Thank you.

This is very brief. Have you time for me to read the original?

The CHAIRMAN. Yes, ma'am.

Mrs. FOSTER. I am Mrs. M. Y. Foster of the League of Women Voters of Montana, representing the Regional Water Resources Committee of Idaho, Montana, Oregon, and Washington. On behalf of the committee, I wish to make the following statement:

As a result of a 4-year study of water resources the League of Women Voters of the United States has agreed on the following position:

Support of those water policies and practices which promote coordinated administration, equitable financing, and regional or river basin planning.

In the Columbia River Basin it soon became apparent that because the river crosses State lines we would have to do likewise in our study. Thus in 1958 a regional committee representing Idaho, Montana, Oregon, and Washington was set up to consider the Columbia River Basin as a complete unit. This group has held three regional conferences and has just completed publication of the booklet "The Great River of the West." This booklet is a study compiled from reports from the local leagues of the four States.

As we studied the Columbia Basin it became obvious that many of our problems were held in common. We were all concerned with control of population, erosion, and floods. We all had questions as to the further development of hydroelectric power, irrigation, navigation, and water storage. We were all aware of the conflicting interests in preserving our wildlife and fish resources and yet developing our basin to the fullest.

Leagues in these four States, currently seeking solutions to these problems are happy to support S. 2549, as introduced by Senator Murray during the 86th Congress. This bill gives promise of the coordinated administration which the League of Women Voters feels is necessary.

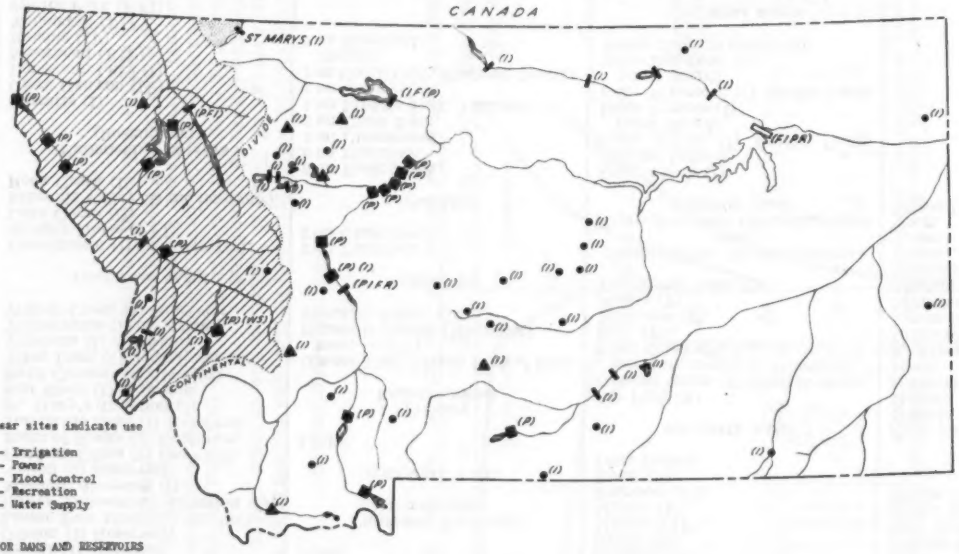
We hope to be able to contribute to public awareness of water resource problems through our booklet, "The Great River of the West."

We are proud to present to you at this time the booklet.

Thank you very much.

The CHAIRMAN. Thank you very much, Mrs. Foster, for bringing us the statements you have from one of the fine organizations interested in water resource development. We appreciate copies of your book.

## MONTANA WATERSHED--WATER DEVELOPMENT MAP




Letters near sites indicate use

I - Irrigation
P - Power
F - Flood Control
R - Recreation
WS - Water Supply

MAJOR DAMS AND RESERVOIRS

- Montana Water Conservation Board (Irrigation)
- Private (Power)
- Bureau of Reclamation (Irrigation)
- U. S. Corps of Engineers (Flood Control)
- Independent Water Users Association (Irrigation)

Columbia River Basin Watershed, 34.8 million acres
Missouri River Basin Watershed, 82.2 million acres
St. Mary's Basin Watershed, 0.4 million acres

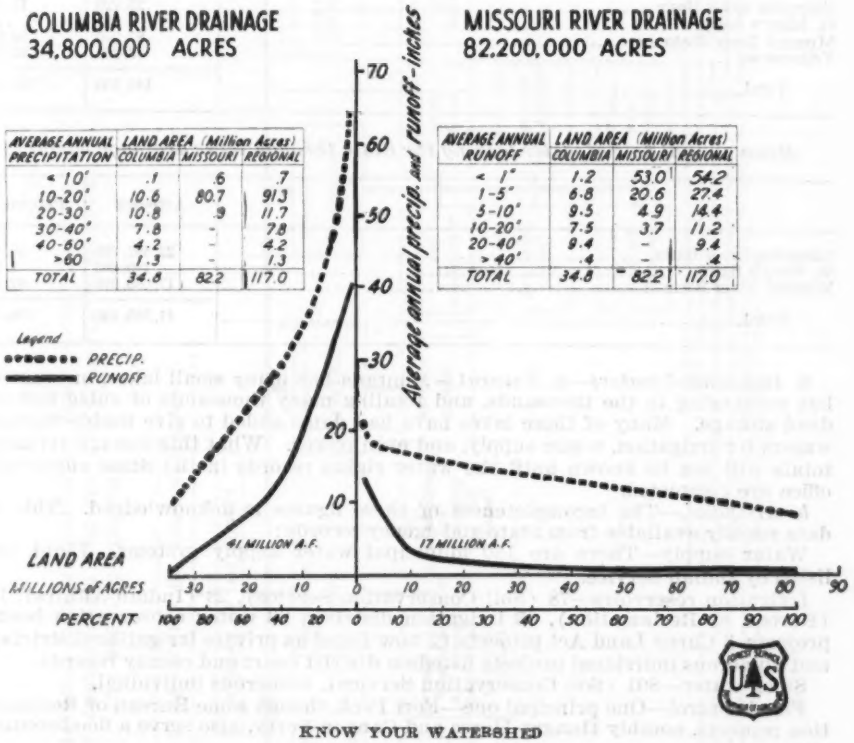
Sources: U. S. Water Resource Development Map
U. S. G. S. Bulletins No. 1360A, 1339, 1346
Bureau of Indian Affairs Communication
Bureau of Reclamation Communication
U. S. Army Corps of Engineers '308' Review Report and Reviews
Montana Water Conservation Board Report, 1952, 1954
Montana Power Co. Stockholders Report 1956

*Montana water development projects*

| Montana Water Conservation Board | U.S. Bureau of Reclamation | U.S. Army Corps of Engineers | Private | Bureau of Indian Affairs [1] |
|---|---|---|---|---|
| MISSOURI BASIN | MISSOURI BASIN | MISSOURI BASIN | MISSOURI BASIN | MISSOURI BASIN |
| Ackley Lake (I). | Anita (I) Reservoir. | Fort Peck (FIPR). | Black Eagle (P). | Big Warm (I). |
| Bainville (I). | Canyon Ferry (PIFR) Reservoir. | COLUMBIA BASIN | Cochrane (P). | Bonneaux. |
| Cooney (I). | Crow Creek (I) pumping. | None. | Ennis (P). | Duck Creek. |
| Deadman's Basin (I). | Dodson (I) pumping. | PROPOSED PROJECTS (Incomplete) | Hauser (P). | Four Horns. |
| Durand (I). | Fresno (I) Reservoir. | COLUMBIA BASIN | Hebgen (P). | Frazer. |
| Frenchman's (I). | Gibson (I) Reservoir. | Libby. | Holter (P). | Tongue River (MWCB). |
| Glacier Lake (I). | Lower Two Medicine (Indian). | *Primary* Recommended | Maroney (P). | Two Medicine (BR). |
| Martinsdale (I). | Lower Yellowstone diversion (I). | Glacier View (North Fork of Flathead—GNP). | Mystic (P). | White Bear. |
| Middle Creek (I). | Missouri diversion (I). | Ninemile Prairie (Blackfoot). | Rainbow (P). | Willow Creek. |
| Nilan (I). | Nelson (I) Reservoir. | Paradise (Clark Fork). | Ryan (P). | COLUMBIA BASIN |
| North Fork, Smith River (I). | Pishkun Dikes (I) Reservoir. | *Secondary* | Lake Helena. | Crow Creek. |
| Petrolia (I). | Point of Rocks (I) Reservoir. | 2 on Flathead. | COLUMBIA BASIN | Hillside. |
| Red Butte (I). | Sherburne Lake (I) Reservoir. | 2 on Clark Fork. | Big Fork (P). | Hortes. |
| Ruby (I). | St. Mary's diversion (I). | *Potential* | Cabinet Gorge (P) (dam in Idaho, reservoir mostly in Montana). | Hubbert. |
| Teton Coop (I). | Sun River (I) diversion. | 6 on Rock Creek. | Flint Creek (P). | Jocko. |
| Theboc Lake (I). | Swift Current (I) diversion. | 6 on Blackfoot. | Kerr (P). | Kickinghorse. |
| Tongue River (Indian Service) (I). | Tiber Dam (IF (P)) Reservoir. | 1 on Clearwater. | Milltown (P). | Little Bitterroot. |
| Valentine (I). | Vandalia (I) diversion. | 3 on Clark Fork. | Noxon (P). | Lower Dry Fork. |
| Willow Creek (I). | Yellowstone (I) diversion. | 1 on Middle Fork, Flathead. | Thompson Falls (P). | McDonald. |
| Winnett (I). | Willow Creek (I) Reservoir. | 1 on Swan River. | INDEPENDENT WATER ASSOCIATION (Only those over 450 surface acres) | Mission. |
| Yellow Water (I). | COLUMBIA BASIN | 1 on North Fork, Flathead (Smoky Range). | MISSOURI BASIN | Ninepipe. |
| Cottonwood (I). | Frenchtown (I) (no reservoir). | 2 on Kootenai. | Birch Creek (I). | Pablo. |
| COLUMBIA BASIN | Hungry Horse (PFI). | | Delmoe Lake (I). | Tabor. |
| East Fork, Rock Creek (I). | Lake Como (I). | | Lake Adam (I) (under Carey Land Board). | Twin. |
| Fred Burr (I). | Missoula Valley (I) (no reservoir). | | Lake Frances (I). | Upper Dry Fork. |
| Nevada Creek (I). | Rock Creek (I). | | Lake Walvoord (I) (under Carey Land Board). | |
| West Fork, Bitterroot (I). | PROPOSED PROJECTS (incomplete) | | Lima Reservoir (I). | |
| | Barratts (I). | | Teton Coop (Bynum) (I). | |
| | Clark Canyon (IP). | | COLUMBIA BASIN | |
| | Lonesome Lake (I). | | Ashley Lake (I). | |
| | Moorhead (FIP). | | | |
| | Reichle (IP). | | | |
| | Yellowtail (PIF). | | | |
| | Spruce Park (PFI). | | | |

[1] Locations not positive.

# DISTRIBUTION OF AVERAGE ANNUAL PRECIPITATION AND RUNOFF IN REGION 1




| AVERAGE ANNUAL PRECIPITATION | LAND AREA (Million Acres) COLUMBIA | MISSOURI | REGIONAL |
|---|---|---|---|
| < 10" | .1 | .6 | .7 |
| 10-20" | 10.6 | 80.7 | 91.3 |
| 20-30" | 10.8 | .9 | 11.7 |
| 30-40" | 7.8 | - | 7.8 |
| 40-60" | 4.2 | - | 4.2 |
| >60 | 1.3 | - | 1.3 |
| TOTAL | 34.8 | 82.2 | 117.0 |

| AVERAGE ANNUAL RUNOFF | LAND AREA (Million Acres) COLUMBIA | MISSOURI | REGIONAL |
|---|---|---|---|
| < 1" | 1.2 | 53.0 | 54.2 |
| 1-5" | 6.8 | 20.6 | 27.4 |
| 5-10" | 9.5 | 4.9 | 14.4 |
| 10-20" | 7.5 | 3.7 | 11.2 |
| 20-40" | 9.4 | - | 9.4 |
| > 40" | .4 | - | .4 |
| TOTAL | 34.8 | 82.2 | 117.0 |

KNOW YOUR WATERSHED

1. *Precipitation.*—Precipitation in Montana ranges from 8 to 40 inches per year with an average of 10 to 15 inches in the eastern plains and 20 inches in the northwestern timbered mountains.

2. *Runoff in relation to area.*—There are three major watersheds in the State of Montana, the Columbia River Basin on the west side of the Continental Divide; the Missouri River Basin, including the Yellowstone and the small St. Mary's Basin on the east side of the divide, the former draining into the Mississippi-Gulf of Mexico, and the latter into the Hudson Bay.

*Area of drainage basins*

| | Square miles | Percent |
|---|---|---|
| Columbia River Basin | 25,220 | 17.23 |
| St. Mary's Basin | 630 | .43 |
| Missouri River Basin | 87,240 | 59.61 |
| Yellowstone | 33,260 | 22.73 |
| Total | 146,350 | 100.00 |

*Mean annual flow of water leaving the State through these drainage basins*

| | Acre-feet | Percent |
|---|---|---|
| Columbia River Basin | 23,497,250 | 56.13 |
| St. Mary's Basin | 710,680 | 1.70 |
| Missouri River Basin | 17,655,610 | 42.17 |
| Total | 41,863,540 | 100.00 |

3. *Impounded waters—a. Natural.*—Montana has many small lakes, uncounted but numbering in the thousands, and totaling many thousands of cubic feet of dead storage. Many of these lakes have had dams added to give usable storage waters for irrigation, water supply, and even power. What this storage actually totals will not be known until the water rights records in the State engineer's office are completed.

*b. Artificial.*—The incompleteness of these figures is acknowledged. This is data readily available from State and agency records:

Water supply—There are 140 municipal water supply systems. Eight are listed by Indian Service.

Irrigation reservoirs—78 (Soil Conservation Service), 23 (Indian Affairs), 13 (Bureau of Reclamation), 43 irrigation districts, 26 water conservation board projects, 3 Carey Land Act projects (2 now listed as private irrigation districts), and numerous individual projects listed on district court and county records.

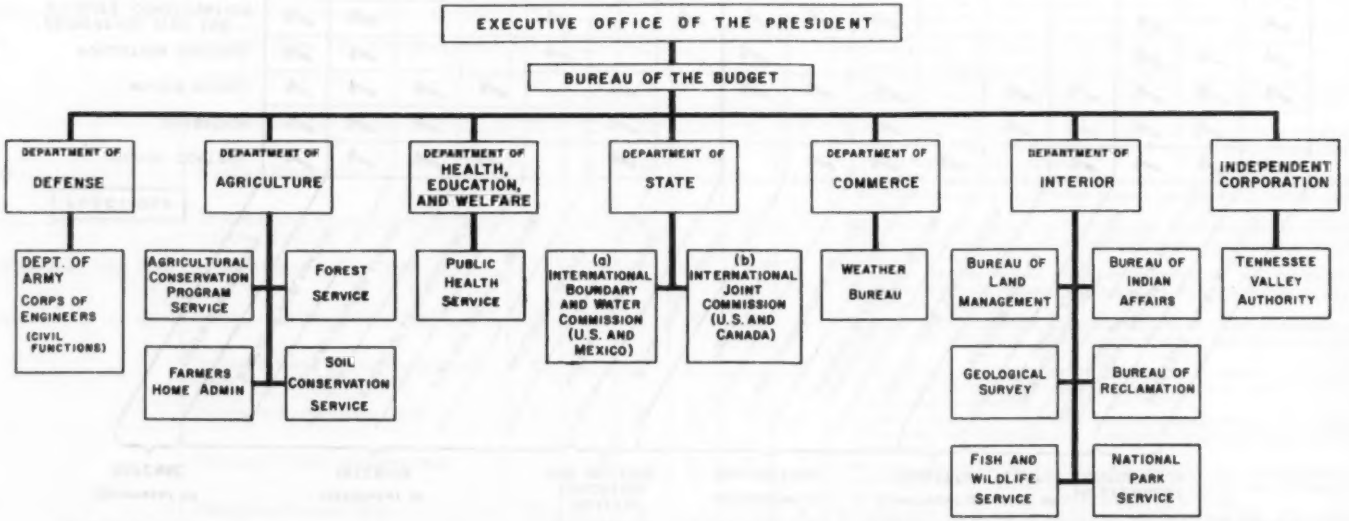
Stock water—801 (Soil Conservation Service), numerous individual.

Flood control—One principal one—Fort Peck, though some Bureau of Reclamation projects, notably Hungry Horse and Canyon Ferry, also serve a flood-control purpose.

Hydroelectric—16 private, 2 Bureau of Reclamation (also listed under irrigation), 1 Corps of Engineers (also listed under flood control).

4. *Ground water.*—No complete information on ground water is available yet. The U.S. Geological Survey is in the process of surveying available ground water. There are 483 artesian wells filed with the State engineer's office, showing 54 percent for domestic use, 32 percent for stock water, 9 percent for house and stock water, 5 percent for irrigation and miscellaneous.

## FEDERAL DEPARTMENTS, AGENCIES AND INTERNATIONAL COMMISSIONS CONCERNED WITH THE DEVELOPMENT, CONSERVATION AND CONTROL OF WATER RESOURCES FOR SPECIFIC PURPOSES




IMPORTANT FOOTNOTES:

From this chart it can be seen that there are 16 federal agencies dispersed among 6 departments, one corporation and 2 international commissions charged with the task of carrying out various federal water policies. The Bureau of the Budget has the following interests in water resources: (a) at the authorization stage—for conformance with the President's legislative program and (b) at the time a project is proposed for inclusion in the President's annual budget. These reviews are to provide advice and guidance to Congress in the consideration of various programs.

In the final analysis, Congress makes the decisions and determines policy and appropriations. It is recognized that power development and navigation are important facets of water resources development, but a line has been drawn between the development, conservation and control of water resources for specific purposes as distinguished from non-consumptive use such as power and navigation. Furthermore, agencies with quite limited or highly specialized interest in water resources are not included. For instance, the Bureau of the Mines (Interior) is concerned with control of water pollution caused by acid mine drainage.

## FEDERAL DEPARTMENTS, AGENCIES AND INTERNATIONAL COMMISSIONS CONCERNED WITH THE DEVELOPMENT, CONSERVATION AND CONTROL OF WATER RESOURCES FOR SPECIFIC PURPOSES

### DEPARTMENTS AND AGENCIES

| FUNCTIONS | DEPARTMENT OF DEFENSE | DEPARTMENT OF INTERIOR | | | | | DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE | | DEPARTMENT OF AGRICULTURE | | | DEPARTMENT OF COMMERCE | DEPT. OF STATE | INDEPENDENT CORPORATION | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CORPS OF ENGINEERS | BUREAU OF RECLAMATION | BUREAU OF INDIAN AFFAIRS | BUREAU OF LAND MANAGEMENT | FISH AND WILDLIFE SERVICE | GEOLOGICAL SURVEY | NATIONAL PARK SERVICE | PUBLIC HEALTH SERVICE | FOREST SERVICE | SOIL CONSERVATION SERVICE | AGRICULTURAL CONSERVATION PROGRAM SERVICE | FARMERS HOME ADMINISTRATION | WEATHER BUREAU | INTERNATIONAL JOINT COMM. UNITED STATES-CANADA | INTERNATIONAL BOUNDARY AND WATER COMM. UNITED STATES-MEXICO | TENNESSEE VALLEY AUTHORITY |
| FLOOD CONTROL | ✔ | ✔ | ✔ | ✔ | | ✔ | | | | ✔ | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ |
| IRRIGATION | ✔ | ✔ | ✔ | | | ✔ | | | | | ✔ | | ✔ | ✔ | ✔ | ✔ | |
| WATER SUPPLY | ✔ | ✔ | ✔ | ✔ | | ✔ | | ✔ | ✔ | | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ |
| POLLUTION CONTROL | ✔ | ✔ | | | ✔ | | | ✔ | | | | | | | ✔ | ✔ | ✔ |
| RECREATION; FISH AND WILDLIFE CONSERVATION | ✔ | ✔ | | | ✔ | | ✔ | ✔ | ✔ | ✔ | | | | | ✔ | | ✔ |
| WATERSHED TREATMENT | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | | ✔ | ✔ | ✔ | | | | | | ✔ |

NOTES:

Geological Survey and the Weather Bureau are known as "Data collecting" agencies (as distinct from "action" agencies like Corps of Engineers, Bureau of Reclamation and T.V.A.). They collect basic data on rainfall, stream flow, mapping and hydrologic research. Of course, some action agencies also collect data, particularly the Corps of Engineers and T.V.A. Since 1954, however, the map-making and data-collecting agencies "have come into their own and the 'action' agencies are relying on them for maps and basic data."

The 5 major federal agencies engaged in flood control activities are: Corps of Engineers, Bureau of Reclamation, Soil Conservation Service, T.V.A. and International Boundary and Water Commission. The 4 main federal water-development agencies are: Bureau of Reclamation, Corps of Engineers, Soil Conservation Service and the T.V.A. The breakdown of the federal agencies concerned with different phases of water development, conservation and control is as follows: 12 deal with flood control, 9 with irrigation, 13 with domestic and industrial water supply, 7 with pollution control, 9 with recreation, fish and wildlife conservation and 10 with watershed treatment.

*Federal agencies working in Montana on water resources problems*

| Department | Agency | Functions | | | | | | Scopes [1] |
|---|---|---|---|---|---|---|---|---|
| | | FC | I | WS | PC | R | WT | |
| Agriculture | Agriculture Conservation Program Service. | X | | | | | X | Cost-sharing projects for protection and conservation of cropland, pasture and range, forest and agricultural water. |
| | Farmers Home Administration (1946) | | X | X | | | | Provides loans to farmers for soil and water conservation. Also provides technical advice and assistance. |
| | Forest Service (1905) | X | | X | | X | X | Promotes conservation and best use of national forest lands through managed timber cropping, grazing, watershed development and recreational use. |
| | Soil Conservation Service (1935) | X | X | X | | X | X | Develops and carries out a permanent soil and water conservation program. Administers flood control and watershed activities of Department of Agriculture. |
| Commerce | Weather Bureau (1890) | X | X | X | | | | Maintains records and gives forecasts of all hydrological aspects of weather—river and flood stage, precipitation, snow gaging, runoff. |
| Defense | United States Army Corps of Engineers (1789). | X | X | X | X | X | | Administers all matters of construction, maintenance, and real estate for improvement of waterways for navigation, flood control, and other water uses. |
| Health, Education, and Welfare. | Public Health Service (1798) | | | X | X | X | | Develops comprehensive program to reduce or prevent pollution and for methods of treating wastes. Conducts water supply requirement studies. |
| Interior | Bureau of Indian Affairs (1824) | X | X | X | X | X | X | Trustees of Indian lands. Assists owners to make effective use of lands and resources. Develops and constructs irrigation facilities. |
| | Bureau of Land Management (1946)—General Land Office—1812. | X | | X | | | X | Manages land and resources of Federal lands, through utilization, development, and conservation (soil and water conservation and watershed treatment). |
| | Bureau of Reclamation (1902) | X | X | X | X | X | X | Locates, constructs, operates, and maintains works for storage, diversion, and development of waters of semiarid and arid Western States. |
| | Fish and Wildlife Service (1940) | | | | X | X | X | Promotes conservation of Nation's wildlife for recreational and economic uses. Investigates and recommends on Federal projects for protection and enhancement of wildlife. |
| | Geological Survey (1879) | X | X | X | | | X | Investigates U. S. water resources—amount, quality, distribution, classification of surface-ground waters. Provides consultative and technical services to other agencies. |
| | National Park Service (1916) | | | | | X | X | Promotes and regulates use of national parks so as to leave them unimpaired for future. Gives technical assistance and sometimes operates recreational aspects of Federal projects. |
| State | International Joint Commission (1911) | X | X | X | X | X | | Has jurisdiction over use of boundary waters. Conducts surveys and investigations on matters of difference. |

[1] U.S. Government Organization Manual (1956-57), League of Women Voters of U.S.A. charts—1956.

Key to functions: FC—Flood control; I—Irrigation; WS—Water supply; PC—Pollution control; R—Recreation-Fish and wildlife conservation; WT—Watershed treatment.

*State agencies working on water resources problems*

| Type | Name | Authority | Make-up | Functions | | | | | | Purpose and scope [1] |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | FC | T | WS | PC | R | WT | |
| Ex officio | Board of land commissioners. | RCM81-101 | Governor, attorney general, superintendent of public institutions, secretary of state. | X | X | X | X | X | X | Has jurisdiction over management and disposition of State and school lands. |
| | Carey Land Act board | RCM81-2001 | Governor, attorney general, secretary of state. | ------ | X | X | ------ | ------ | X | Administers contracts for reclaiming lands offered for homesteading by Federal Government. |
| Ex officio and appointive. | Interdepartmental council on natural resources. | Laws of 1953, ch. 95. | Heads of 8 various State departments. | X | X | X | X | X | X | Joint consideration of administrative and legislative needs with regard to natural resources. Reports and recommends to Governor. |
| | Soil conservation commission. | RCM76-104 | State commissioner of agriculture, 1 Montana Experiment Station, 1 Montana Extension Service, 4 others. | X | X | X | ------ | X | X | To put into practice corrective methods in soil conservation. Sets up soil conservation committees who set up soil conservation districts. |
| | State forestry board | RCM28-101 | Governor, 7 appointive members of types specified by law. | X | ------ | X | ------ | X | X | For protection and conservation of State forest resources, forest range and water, regulation of streamflow, and prevention of soil erosion. |
| | State planning board | RCM89-302 | Governor, State engineer, 3 other members same as WCB. | X | X | X | X | X | X | To make and adopt a comprehensive plan for the physical development of the State of Montana. |
| | State pollution council | Laws of 1955, ch. 142. | Executive officer—State board of health, fish and game director, State engineer and appointive members. | ------ | ------ | X | X | ------ | ------ | To protect, maintain, and improve quality and potability of waters of State. To provide comprehensive program of pollution abatement. Stream classification. |
| | Water conservation board | RCM89-103 | Governor, State engineer, 3 other members. | ------ | X | X | ------ | ------ | ------ | Has power to construct and operate irrigation projects, and to purchase, exchange land, water rights, easements and franchises necessary. |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Appointive | Commissioner of State lands and investments. | RCM81-201 | 1 appointee | X | X | X | X | X | X | Administers lands under supervision of Board of Land Commissioners. |
| | Director of agricultural experiment station. | RCM75-70 | do | | X | X | | | | To administer development of strains of agricultural, livestock, and horticultural species best suited to Montana. |
| | Fish and game commission | RCM26-101 | 5 members—1 from each of 5 geographical districts. | | | | X | X | X | Has supervision over all wildlife with regard to protection, preservation, and propagation of same. |
| | Montana Grass Conservation Commission. | RCM46-2303 | 5 members from specific groups. | | X | | | X | X | To insure proper organization and operation of all grazing districts organized under State law. |
| | State board of health | RCM69-101 | 7 members—3 medical, 1 dentist, 3 lay, 1 executive director. | FC | I | WS | PC | R | WT | Administrative agency for carrying out work of water pollution council and coordinating all pollution work in State. |
| | | | | | | X | X | X | | |
| | State engineer | RCM81-2006 | 1 appointee, 1 assistant | X | X | X | X | X | X | Compact commissioner to deal with other States on water matters. Advises district courts in creation of irrigation districts. Represents State on water committees. Surveying water rights. |
| | State forester | RCM81-1403 | 1 appointee | | | X | | X | X | To secure most complete utilization of all forest products and resources. |
| | State oil and gas commission | RCM60-125 | 5 members | | | | X | | | To prevent pollution of water supplies by oil, gas, and salt or brackish water; to regulate disposal of salt water and oilfield waste. |
| | State bureau of mines and geology. | RCM75-605 | Director—President of school of mines. | | | X | | | | To provide information on natural resources of State and to cooperate with other State government units with field examinations where possible. |

[1] Revised Codes of Montana, and Montana Directory of Public Affairs—Ralph E. Owings.

Key to functions: FC=Flood control; I=Irrigation; WS=Water supply; PC=Pollution control; R=Recreation-Fish and wildlife conservation; WT=Watershed treatment.

*Regional agencies and organizations working in Montana on water resources problems* [1]

| Type | Name | Authority | Purpose and scope |
|---|---|---|---|
| | MISSOURI BASIN | | |
| Quasi-governmental commissions and committees. | Department of Agriculture Missouri Basin Field Committee. | Activated by Department of Agriculture in 1946. | To provide machinery for correlation of activities of subordinate bureaus engaged in Missouri River Basin development. |
| | Department of Interior Missouri Basin Field Committee. | Activated by Department of the Interior in 1946. | To provide machinery for correlation of activities of subordinate bureaus engaged in Missouri River Basin development. |
| | Mississippi Valley Association; Missouri Basin Interagency Committee. | No legal status, voluntary. | Provides a forum for interchange of information and coordination of activities in the planning and development of works for the control and use of the waters of the Missouri Basin. No policymaking power. No funds. |
| | Missouri Basin Survey Commission... | President, Commission Order No. 10318, January 1952. | To survey possibilities of developing a comprehensive plan of development for Missouri River Basin resources. Report submitted Jan. 12, 1953. |
| | Missouri River Reservoir Control Committee. | Organized by U.S. Corps of Engineers. | To work out semiannual operating plans or Corps of Engineers flood control reservoirs in the Missouri Basin. Representatives of States and Federal agencies involved. |
| | Missouri River States Committee..... | Formal organization of 10 basin States, 1943. | To coordinate and integrate activities of member States in a joint approach to the major problems of the region. Sponsors a Federal-State compact for the Missouri River Basin. |
| | Yellowstone Compact Commission.... | Ratified by States and Congress in 1951. | Composed of State engineers of Montana and Wyoming and director of U.S. Geological Survey. Has jurisdiction over water allocation and uses subsequent to 1950, subject to amendment by State legislative action. |
| | COLUMBIA BASIN | | |
| | Columbia Basin Inter-Agency Committee. | No legal status, voluntary..... | Provides an informal agency for exchange of information and coordination of activities in planning development of Columbia River Basin. Subcommittees: (1) Water Management Committee—Water gaging and depletion studies; (2) Water Resources Committee. Committees and subcommittees contain representatives of various States. Montana State engineer serves for Montana. |
| | Columbia Inter-State Compact Commission. | Informal, joint State action..... | Set up by States of Washington, Montana, Idaho, Oregon (Utah and Nevada) to develop a Columbia River compact for the allocation of the waters of the Columbia River. To be submitted to State legislatures in 1957. |
| | Northwest Governor's Power Policy Committee. | Initiated in 1953 by Governors..... | Organized by Governors of Montana, Idaho, Washington, and Oregon to initiate planning of power developments in Columbia Basin. Considers related problems of conservation of wildlife and upstream-downstream effects. |
| | Pollution Control Council of Pacific Northwest Area. | Health officers of States and Provinces. | To instigate proper planning for development of basins of area to protect, prevent, and control pollution. |

| | | | |
|---|---|---|---|
| Nongovernmental | Missouri Basin Engineering Health Council. | | |
| | Pacific Northwest Development Association. | Voluntary—private organization membership. States of Washington, Oregon, Idaho, and sections of Montana, Wyoming, Nevada, and Utah bordering on the Columbia Basin area. | Dedicated to work for continued resource conservation and development through the combined efforts of private enterprise, group initiative and established Government agencies. |
| | Public Affairs Committee, Inc. | | |
| | Western Forestry and Conservation | Founded 1909—made up of private, State, governmental foresters of Western United States and Canada, anyone interested in forest management. | To encourage better forest practices and management. |

[1] Missouri, Land and Water—Report of Missouri Basin Survey Commission. Biennial Report of Montana State Engineer—November 1956. Western Forestry and Conservation Association Annual Report.

NONGOVERNMENT ORGANIZATIONS WORKING ON WATER RESOURCES PROBLEMS

American Farm Bureau Federation, Chicago, Ill.[1]
American Forest Products Industries, Washington, D.C.[1]
American Forestry Association, Washington, D.C.
American Watershed Council, Inc., Washington, D.C.
Chamber of Commerce of U.S.A. (Natural Resources Department), Washington, D.C.[1]
Conservation Foundation, New York, N.Y.
Farmer's Educational and Cooperative Union of America (National Farmers' Union), Denver, Colo.[1]
Friends of the Land, Columbus, Ohio
General Federation of Women's Clubs, Washington, D.C.[1]
Izaak Walton League of America, Chicago, Ill.[1]
Keep America Beautiful, Inc.
League of Women Voters of U.S.A., Washington, D.C.[1]
Montana Conservation Council.[1]
National Association of Soil Conservation Districts.[1]
National Audubon Society, New York City.
National Council of State Garden Clubs, New York, N.Y.[1]
National Council for Stream Improvement, New York, N.Y.[1]
National Grange, Washington, D.C.[1]
National Parks Association, Washington, D.C.
National Reclamation Association, Washington, D.C.[1]
National Water Conservation Conference.
National Watershed Congress.
National Wildlife Federation, Washington, D.C.[1]
Natural Resources Council of America, Washington, D.C.
North American Wildlife Foundation, Washington, D.C.
Outdoor Writers Association of America.
Resources for the Future, Inc., Washington, D.C.
Sierra Club, California.
Soil Conservation Society of America, Des Moines, Iowa.[1]
Wilderness Society, Washington, D.C.
Wildlife Management Institute, Washington, D.C.
Wildlife Society, Executive Secretary Daniel L. Leedy, Fish and Wildlife Service, Washington, D.C.

NATIONAL LEGISLATIVE BIBLIOGRAPHY ON WATER

A Chronological Résumé of Federal Water Law to Jan. 1, 1949, appears in the Hoover Commission Report, January 1949:
  Appendix K: Task Force Report on Water Resources Project
  Appendix L: Task Force Report on Natural Resources
Water Resources Law: the Report of the President's Water Resources Policy Commission, vol. III, 1950
Federal Water Law, Jan. 1, 1950, to June 1955, Commission on Organization of the Executive Branch of the Government (2d Hoover Commission) Task Force Report on Water Resources and Power, vol. III
  Public Law 566, 83d Cong., 2d sess.
  Public Law 1018, 84th Cong., 2d sess.
Proposed legislation:
  Draft bill, Water Resources Act of 1951 (recommendation of the President's Water Resources Policy Commission Report, 1950)
  Recommendations of 1st and 2d Hoover Commission Reports
  See Catalog of U.S. Documents, Library of Congress gives record of all legislation and proposed legislation

[1] Active Montana chapters.

MONTANA LEGISLATIVE BIBLIOGRAPHY ON WATER

Dams and reservoirs, RCM, 1947, title 89, ch. 7
Drainage district, RCM, 1947, title 89, chs. 22–28
Flood control
Irrigation, RCM, 1947, title 89, chs. 12, 21
Pollution, Laws of 34th Session, 1955, ch. 142, RCM, 1947, title 69, sec. 1309, 1310; title 94, sec. 3552; title 26, sec. 339
Public waters, RCM, 1947, title 89, ch. 5–6
Recreation
Sewage disposal, RCM, 1947, title 69, sec. 125
Underground water, RCM, 1947, title 89, ch. 29
Water commissioners, RCM, 1947, title 89, ch. 10
Water development:
- Conservation revolving fund, RCM, 1947, title 89, ch. 4
- Reclamation, RCM, 1947, title 89, ch. 2
- State Water Conservation Board, RCM, 1947, title 89, ch. 1
- State Planning Board, RCM, 1947, title 89, ch. 3
- Water Users Association, RCM, 1947, title 89, ch. 11

Water rights, RCM, 1947, title 89, ch. 8
Watershed development
Water supply, RCM, 1947, title 69, secs. 1301–1313.
Yellowstone Compact, RCM, 1947, title 89, ch. 9
Possible legislation:
- Columbia River compact
- Underground water rights code
- Approval of Sage Creek Water Allocation Agreement With Canada
- Conveyance of stored water bills
- Modernized water right code

BIBLIOGRAPHY ON WATER RESOURCES AND RELATED PROBLEMS

The following bibliography is not meant to be an exhaustive compilation of water resource material. It is a combination of bibliographical material suggested by the National League of Women Voters, members of the State Resource Committee, library consultants, Montana State Engineer, and Director of Montana Health Board.

Realizing that the reading of all the material listed is an impractical goal, the State Resource Committee has taken the liberty of starring some items as more basic than others to the objectives of the league study. However, to avoid editorial limitation the whole list is offered.

Key: N—Listed in National League of Women Voters bibliography.
M—Available at Montana School of Mines through interlibrary loan.
X—Available through interlibrary loan or can be ordered.
*—Especially recommended as basic.

It is suggested that local leagues consult with local libraries and note further for their memberships which items are locally available.

## GENERAL

| Key | Title |
|---|---|
| | "A Brief Summary of Technology and Economics of Water Supply." Rand Corporation Survey Study. James C. deHaven. Gore & Hirshleifer. 1953. |
| M | "America's Needs and Resources." J. Frederic Dewhurst & Associates. The Twentieth Century Fund, New York. 1955. (SEC. 17, Land and Water Conservation and Development.) |
| •NX | "Concepts of Conservation." Conservation Foundation, 30 East 40th St., New York, N.Y. 25 cents. |
| NX | "Conservation Handbook." Samuel H. Ordway, Jr. Conservation Foundation, 30 East 40th St., New York, N.Y. 50 cents. (Contains glossary of terms.) |
| NX | "Conservation of Ground Water." Harold E. Thomas. McGraw Hill. 1951. |
| NX | "The Limits of the Earth." Fairfield Osborn. Boston, Little Brown & Co. 1953. |
| •NM | "The Nation Looks at Its Resources." Report of the Mid-Century Conference on Resources for the Future. 1953. Resources for the Future, Inc., 1145 19th St. NW., Washington, D.C. November 1954. $5. |
| NM | "Washing Our Water." Helen B. Woodward. Public Affairs Pamphlets, 25 East 28th St., New York, N.Y. No. 193. 25 cents. |
| NX | "Water for the Future." Martin Packman. Editorial Research Reports, 1011 20th St. NW., Washington, D.C. $1. 15 pp. |
| NM | "Water, Land, and People." Bernard Frank and Anthony Netboy. Knopf. 1950. |
| | "Water—Or Your Life." Arthur E. Carhart. Lippincott Co. 1951. |

## GOVERNMENTAL PUBLICATIONS—SUBJECT: ORGANIZATION AND POLICY

| | |
|---|---|
| •NM | "A Water Policy for the American People, 1950." A Report of the President's Water Resources Policy Commission. In 3 volumes:<br>Vol. 1: "General Report."<br>Vol. 2: "Ten Rivers in America's Future."<br>Vol. 3: "Water Resources Law." |
| | "A Water Policy for the American People, 1950." Summary of 3 volumes above. |
| | "Conservation and Development of Water Resources." Joint hearings before the Committee on Interior and Insular Affairs, 84th Cong., on S. Res. 281. U.S. Printing Office. 1956. |
| •NM | "Hoover Commission Report No. 1, Volume on Reorganization of Department of Interior." Mar. 1949. Superintendent of Documents, U.S. Printing Office, Washington, D.C. 30 cents. "Task Force Report on Natural Resources." 1949. Superintendent of Documents, U.S. Printing Office, Washington, D.C. 50 cents. |
| •NM | "Hoover Commission Report No. 2, Reports of the Water Resources Task Force." January 1956. 3 vol. set. $6.75 a set. U.S. Printing Office, Washington, D.C. |
| •M | "Missouri, Land and Water." Report of Missouri River Survey Commission. 1953. |
| •M | "Resources For Freedom." Report of President's Materials Policy Commission. 1952. Vol. 1. |
| •M | "State Water Law in the Development of the West." Report to the Water Resources Committee, National Resources Planning Board. June 1943. |
| X | "The Missouri River Basin Development." Missouri Basin Inter-Agency Committee and Missouri River States Committee. June 1952. |
| •NM | "Water Resources Policy." A report by the Presidential Commission on Water Resources Policy. December 1955. H. Doc. 315. |

## GOVERNMENTAL PUBLICATIONS—SUBJECT: WATER AND WATER RESOURCES

| | |
|---|---|
| M | "A Cooperative State-Federal Report on Water Pollution." Missouri River Drainage Basin. Water Pollution Series No. 3, Federal Security Agency, Public Health Service. |
| M | "A Cooperative State-Federal Report on Water Pollution." Yellowstone River Drainage Basin. January 1952. Water Pollution Series No. 23, Federal Security Agency. Public Health Service. |
| M | "Annual Reports, Secretary of Interior." 1953, 1954, 1955. |
| X | "Bibliography of Material on Missouri Basin Development." Virginia Coker Westfall. Report No. 22, 1950. Governmental Research Bureau. University of South Dakota. |
| M | "Chief of Engineers, U.S. Army, Civil Works Activities." Annual Report, 1955. |
| NX | "Chronological History of Soil Conservation Service and Related Events." Department of Agriculture, Soil Conservation Service. December 1955. Free. |
| X | "Columbia River Basin—Development of Water and Other Resources, Present and Potential." Department of Interior, Bureau of Reclamation. June 1946. |
| NM | Department of Agriculture Yearbook: 1955, "Water"; 1949. "Trees"; 1948, "Grass." "Water": pages 1–8, "Our Need for Water"; 41–51, "Where We Get Our Water"; 189–198, "The Management of Public Watersheds"; 161–165, "Caring for Our Watershed", 577–578, Water and Wildlife. |
| M | "Geology and Ground Water Resources of South Eastern Montana." E. S. Perry. Montana School of Mines. 1935. |
| M | "Ground Water in Eastern and Central Montana." E. S. Perry. Montana School of Mines. 1931. |
| M | "Ground Water Resources of Judith Basin." E. S. Perry. Montana School of Mines. 1932. |
| NX | "Highlights in Forest Conservation." 1952. U.S. Department of Agriculture, Forest Service. No. 83. 15 cents. |
| M | "Indirect Benefits of Irrigation Development." Department of Agriculture, Montana State College, Experiment Station, Bozeman, Mont. Bull. 517. |
| •X | "Information Bulletin on a Study of Water Resources Development of the Columbia River Basin." U.S. Corps of Engineers. 1956. |
| M | "Irrigation Development in Montana." Department of Agriculture, Montana State College, Experiment Station, Bozeman, Mont. Bulls. 103 and 353. |

**See footnote at end of table.**

GOVERNMENTAL PUBLICATIONS—SUBJECT: WATER AND WATER RESOURCES—Continued

| Key | Title |
|---|---|
| NM | "Know Your Watershed." Leaflet No. 282. U.S. Department of Agriculture, Forest Service. 1948. Free. |
| M | "Let's Have Clean Waters." U.S. Department of Health, Education, and Welfare. Public Health Service Publication No. 264. |
| X | "Little Waters," H. S. Person (for the Soil Conservation Service). Resettlement Administration, R.E.A. Nov. 1935. Revised 1936. |
| X | "Missouri River Basin Development Program." A Study Guide. Otto G. Holberg. University of Nebraska, Extension Service. 1950. |
| *M | "Montana State Engineer." Biennial Report. Nov. 30, 1956. |
| M | Office of State Forester, 15th Report, 1954–1956. |
| NX | "Our Forests and What They Mean To Us." U.S. Department of Agriculture, Forest Service. No. 83, 15 cents. |
| M | "Physiography and Ground Water Supply of Big Hole Basin, Montana." E. S. Perry. Montana School of Mines. 1937. |
| M | "Progress Reports—Missouri River Basin." Department of Interior Missouri River Basin Field Committee. Quarterly, Sept. Dec. & March. Annual report in July. |
| X | "Reclamation Handbook—Conservation." Bulletin No. 32. Department of Interior. Bureau of Reclamation. |
| M | "Report of Chief of Forest Service." U.S. Department of Agriculture, 1955. |
| X | "Some Economic and Social Aspects of Irrigation in Montana." Department of Agriculture, Montana State College, Experiment Station. |
| *M | "Summary Report on Water Pollution." Pacific Northwest Drainage Basins. 1951. Federal Security Agency. Public Health Service. |
| M | "The National Forests." Fact sheet. Department of Agriculture, U.S. Forest Service. Aug. 1954. |
| M | United States Geological Survey Bulletins.<br>"Annual Runoff in U.S." No. 52.<br>"Estimated Use of Water in U.S." 1950. No. 115.<br>"Reservoirs in the United States, 1954." No. 1360–A.<br>"Surface Water Supply of the U.S., 1954." No. 1339.<br>Part 6–A. Missouri River Basin above Sioux City, Iowa.<br>"Surface Water Supply of the U.S., 1954." No. 1346.<br>Part 12, Upper Columbia Basin.<br>"Water Situation in U.S. With Special Reference to Ground Water." No. 114. |
| NX | "Water and Our Forests." U.S. Department of Agriculture, Forest Service. 1951. 10 cents. |
| *NM | "Water Pollution in the U.S." 1951. Public Health Service Pub. No. 64. 35 cents. |
| M | "Water Pollution Series." Public Health Service. |
| M | "Water Resources Development." 2 maps. $2.25. U.S. Printing Office, Washington, D.C. |
| *M | "Water Resources Survey." State Engineers Office, Helena, Mont. 1955. Foreword gives summary information on Montana water rights.<br>Vol. 1: Big Horn, Carbon, Custer, Gallatin, Golden Valley, and Meagher Counties.<br>Vol. 2: Musselshell, Park, Rosebud, Stillwater, Sweetgrass, Treasure, Wheatland, Yellowstone, Deerlodge, Madison, and Silver Bow Counties. |

GOVERNMENTAL PUBLICATIONS—SUBJECT: WATER LEGISLATION

| | |
|---|---|
| M | "Congressional Hearings on Federal Assistance for Small Reclamation Projects." February 1955. 84th Cong., 1st sess., on H.R. 104, H.R. 384, and H.R. 3817. |
| M | "Congressional Hearings on Hell's Canyon Dam." July 1955. 84th Cong., 1st sess., on H.R. 4719, H.R. 4730, H.R. 4739, and H.R. 4790. |
| M | "Congressional Hearings on Water Pollution." July 1955, March 1956. 84th Cong., on S. 890 and H.R. 9540. |
| M | "Congressional Hearings on Water Rights Settlement Act of 1956." February and March 1956. 84th Cong., on H.R. 8325, H.R. 8347, H.R. 8560, and H.R. 9505. |
| *M | "Draft Bill—Water Resources Act of 1951." January 1953. |
| *M | House Doc. No. 238, 73d Cong., 2d sess. (Feb. 5, 1934). Corps of Engineers "308" Review Report on Missouri River Basin. |
| X | House Doc. No. 216, 81st Cong., 1st sess., Yellowstone Basin. |
| *M | House Doc. No. 531, 81st Cong., 2d sess. (Mar. 30, 1950). U.S. Corps of Engineers "308" Review Report on Columbia River Basin. |
| M | Report of Committee on Interior and Insular Affairs, Helena Valley Unit, Missouri River Basin project. September 1955. |
| X | Senate Doc. No. 191, 78th Cong., 2d sess. April 1944. Missouri River Basin. |
| X | Senate Doc. 247, 78th Cong., 2d sess. January 1945. Missouri River Basin. |
| | See also "Digest of Public General Bills," Library of Congress (by number of Congress). (Gives a record of all bills introduced in Congress and what happens to them.)<br>See also other legislative references such as "Congressional Quarterly." |

**See footnote at end of table.**

## PUBLICATIONS BY ORGANIZATIONS

| Key | Title |
|---|---|
| X | "Annual Legislative Report of National Grange." 89th Annual Session. Cleveland, Ohio. Pages 9–11. |
| X | Annual Report—1955 Conservation Foundation. 30 East 40th St., New York, N.Y. Pages 13–14, water law. |
| N | "Big Government and Conservation." December 1951. League of Women Voters of United States. No longer available except in reference files. |
| N | "Big Government and the Citizen." January 1951. League of Women Voters of United States. No longer available except in reference files. |
| NX | "Concepts of Conservation." Conservation Foundation. |
| NX | "Conservation Handbook." Conservation Foundation. |
| *X | "Factors Influencing the Establishment of a National Water Policy." H. E. Thomas. Soil Conservation Society of America. |
| X | "Industry Reports on Natural Resources." Natural Resources Dept., U.S. Chamber of Commerce. |
| X | "Our Water Resources." 1953. U.S. Chamber of Commerce. |
| M | "Policy Declaration on Natural Resources." 1953. U.S. Chamber of Commerce. |
| *X | "Principles of a Sound National Water Policy." July 1951. National Water Policy Panel of Engineers Joint Council. |
| X | Report of the Third Watershed Conference. |
| *X | Resolution on protection, management and use of watershed areas. National Reclamation Association. |
| X | "Riparian and Appropriate Water Rights." Sports Fishing Institute. Bond Building, Washington, D.C. Bull. No. 54. May 1956. |
| M | Statement of Policy and Objectives in Water Pollution Control. National Wildlife Federation. |
| M | Statement of Water Use Policy for Montana. Montana Chamber of Commerce. |
| *NM | "The Future of Our Natural Resources." Annuals of American Academy of Political and Social Science, Philadelphia. May 1952. |
| NX | "Water in Industry—A Survey of Water Use in 3,000 Plants." Conservation Foundation. Available from National Association of Manufacturers. No charge. |
| M | "Water Supply and Watershed Protection." Pollution Council, Pacific Northwest Area. June 1956. |
| *X | "Wildlife Resources and the Pending National Water Policy." Wildlife Management Institute, Wire Building, Washington, D.C. |

## PUBLICATIONS IN PERIODICALS

| | |
|---|---|
| *M | "America Becomes a Have-Not Nation." Peter F. Drucker. Harper's magazine. |
| | "Conservation Review." June 1956. Sierra Club Bulletin. |
| | "Crises Spots in Conservation." Nov.-Dec. 1955. Outdoor America. Also available from Izaak Walton League of America, Inc., 31 North State St., Chicago, Ill. |
| NM | "How Are We Fixed for Water?" Francis Bello. Mar. 1951. Fortune magazine. |
| * | "Our Evolving National Water Policy." David G. Temple. Sept. 1956. American Forests. |
| NM | "Our Water Supply—Vital Economic Factor." McLellan Smith. Nov. 12, 1955. Magazine of Wall Street and Business Analyst. |
| NM | "Plenty of Water—But None To Waste." Sept. 9, 1950. Business Week. |
| | "Protection in Means of Diversion of Ground Water Supplies." Wells A. Hutchins. Nov. 1940. California Law Review. |
| | "The Nation's Available Water Resources." May 1955. Journal of Soil and Water Conservation. |
| | "The Nation's Water Resource Problems." July 1955. Journal of Soil and Water Conservation. |
| M | "The Search for a Stable Water Right in Montana." Robert G. Dunbar. Oct. 1954. Agricultural History. |
| | "U.S. Running Short of Water." July 8, 1955, "U.S. News & World Report." |
| NM | "U.S. Water—Can We Supplement Our Outgrown Sources—At a Price." Aug. 21, 1950. "Life." |
| NM | "Water—A Special Report." September 1952. "Power." |
| NM | "Water for the World's Growing Needs." August 1952. "National Geographic." |
| | "Watershed Damage, Its Signs & Causes." Clark H. Gleason, Paul E. Packer, & Roy D. Hockensmith. June 1955. "American Forests." |
| | "Wilderness Bill." May 1956. Sierra Club Bulletin. |
| NM | "Will Water Become Scarce." Apr. 27, 1956. (U.S. Army Corps of Engineers.) "U.S. News & World Report." |

See footnote at end of table.

SPEECHES AND LECTURES

| Key | Title |
|---|---|
| | Fred E. Buck, Montana state engineer:<br>June 14, 1952, before Western Outdoor Writers Association of America at Glacier National Park.<br>June 22, 1952, before Columbia Basin Inter-Agency Committee at Missoula, Mont. |
| | J. Hugo Aronson, Governor of Montana: July 8, 1956, at dedication of Noxon Dam. |
| M | "Montana's Water Conservation Program." D. P. Fabrick (Montana Water Reclamation Association). July 30, 1953. Statement to Missouri Basin Inter-Agency Committee. |
| *M | "Our Nation's Water Resources—Policies and Politics." A Series of Lectures by Adm. Ben Moreel at University of Chicago, Apr. 30-May 4, 1956. Available from Jones & McLaughlin Steel Co., 3 Gateway Center, Pittsburgh 30, Pa. (gratis). |
| M | "Outline of History, Accomplishments and Future Activities of the Missouri River States Committee." D. P. Fabrick (Montana Water Reclamation Association). Sept. 7, 1955, before Missouri River States Committee at Rapid City, S. Dak. |
| | "Positive Program for Conservation." Lee Metcalf. Apr. 11, 1956. |
| M | "Water and Land Conservation and Use." Stuart Symington. Talk before National Rivers and Harbors Congress, Washington, D.C. May 11, 1956. |
| *M | Draft Bill, "Columbia Interstate Compact." Aug. 6, 1956. Columbia Interstate Compact Commission, 320 Symons Building, Spokane 4, Wash. |

CREDIT ACKNOWLEDGMENT: The incompleteness of this information is recognized at the outset. It is only hoped that this compilation will stimulate further research in the interest of more complete and accurate facts about Montana's water resources and their relation to the national problem.

Many thanks are due the State engineer of Montana; the director of the Montana Board of Health; the librarian of the Montana School of Mines; representatives of the U.S. Forest Service; U.S. Bureau of Indian Affairs; U.S. Army, Corps of Engineers; U.S. Bureau of Reclamation; U.S. Soil Conservation Service; Montana Water Conservation Board, and the Montana Power Co.

(Publications mentioned and additional information on water resources as compiled by the Montana League of Women Voters will be found in the committee files.)

The CHAIRMAN. Mr. Eugene Pike.

## STATEMENT OF EUGENE PIKE, MANAGER OF THE MISSOULA ELECTRIC COOPERATIVES AND TRUSTEE OF THE NORTHWEST PUBLIC POWER ASSOCIATION

Mr. PIKE. Mr. Chairman, and members of the select committee, my name is Eugene Pike.

For the past 13 years I have served as the manager of the Missoula Electric Cooperative here in Missoula. I also am a member of the board of trustees of the Northwest Public Power Association and serve on its legislative committee and its upstream-storage committee.

At the request of Mr. Gus Norwood, the executive secretary of the Northwest Public Power Association, I appear here today to present the association's statement, including 15 exhibits, which he prepared for the use of your committee.

To save time I will not read his full statement, but will with your permission read the last two pages which deal with 14 specific areas he recommends for consideration by your committee. Several of the items should be of more than passing interest to the general public who are concerned about the future development of the resources of our community and Nation.

The CHAIRMAN. Very good.

Mr. PIKE. (1) Legislative reorganization. Congress should give consideration to reorganization of its committee system, so as to do away with the present overlap among the Public Works Committee, Interior Committee, and other committees. We would urge generally a committee on natural resources or at most two committees, one on water resources and one on land resources. The joint-committee approach is another possibility.

2. Department of Natural Resources. The present division of responsibility among the Departments of Interior, Agriculture, and Defense is not logical. The Congress should give consideration to the establishment of a Department of Natural Resources with two basic divisions, a Division of Water Resources and a Division of Land Resources, as suggested in the minority report of the first Hoover Commission (Acheson, Pollock, Forrestal).

3. Reorganization of the Bureau of Reclamation into a nationwide agency as a broad division of water resources. It should be responsible for water conservation and development on a truly multiple-purpose basis. Such reorganization need not preclude the use of military personnel on civil work; witness our experience with the CCC.

4. Adoption of a long-range capital-investment program in natural resources. We need about a 50-year program for systematically developing our natural resources. We are not urging the reestablishment of the National Resources Planning Board. We thing planning should be an inherent legislative and executive function divided among the Congress, the Department of Natural Resources, and the Executive Office of the President.

5. Adoption of a Federal capital budget. We favor legislation along the lines of S. 1244 for a capital budget which recognizes the distinction between long-range capital investments in productive, self-liquidating projects and programs as against the current expenditures of government.

In amplification of these recommendations we submit exhibit 3, an address to the Theodore Roosevelt Conservation Conference entitled "Conservation's Hundred Billion Dollar Challenge," by myself, at Denver, October 2, 1958. Also I call attention to my similar testimony of February 16, 1959, before the Senate Interior and Insular Affairs Committee during the hearings on Federal power-marketing policies.

6. Endorsement of the Kerr-Trimble bills. We endorse these these bills in principle particularly in regard to the adoption of a 100-year economic service life for water-resources investments. The foundation for the 100-year approach has been laid in Senate Resolution 148 which requires that all agencies report the feasibility of future projects on both a 50- and 100-year basis when reporting to the U.S. Senate. The new "Greenbook of 1958" is also trending in this direction. Another horizon in the Kerr-Trimble bill is the inclusion of indirect or secondary benefits in evaluating projects. The Bureau of Reclamation has done some pioneering in this field. Undoubtedly more study is needed but we should get on with it.

7. Endorsement of S. 1927 to change the Bonneville Power Administration into the Bonneville Power Corporation. This is not a Columbia Valley Authority or a Tennessee Valley Authority. We think it is a much more realistic recognition of the need for a regional administrative machinery for better administration and financing of

a regional, river-basin challenge such as presented by the Columbia River Basin. Two hearings have been held by the Senate Public Works Committee. Such legislation should be enacted.

8. Endorsement of the Kerr recreation bill to permit cost allocation for recreation purposes in connection with water resources projects.

9. Separation of the natural-gas and the hydroelectric power functions of the Federal Power Commission. Since about 90 percent of the work of FPC is now in the gas field, that agency might now more appropriately be renamed the Federal Natural Gas Commission. The hydroelectric power functions might well be transferred to a new Commission, possibly in connection with the proposed Department of Natural Resources. Increasingly, FPC has fallen back in the hydro field. It failed to protect the public interest in such cases as the Hells Canyon and the fast tax writeoff decisions. The Commission publicly admits that there are over 500 hydroelectric projects which FPC believes should be licensed but which as yet are not under license. In its 38 years of activity FPC has issued licenses for only 7 percent of the Nation's hydroelectric power potential. Over 85 percent of the Nation's hydro is still unharnessed. Let's go on with the job of tapping our potential waterpower resources. To put it bluntly, FPC has become a claimant agency of private-monopoly electric corporations. No minor reform will take care of this problem.

10. Endorsement of legislation for the Alaska Water Resources Commission.

11. Endorsement of the Magnuson bill, S. 584, to define comprehensive plan.

12. Endorsement of Senate Resolution 71 for a national power study.

13. Endorsement of community facilities legislation to make available Federal loan funds to local and State governments for construction of water-resources projects.

14. A thorough study of upstream storage as a basic method of multiple-purpose river control.

## CONCLUSION

The Nation at present is drifting aimlessly in the field of water resources. The piecemeal approach is taken both at the legislative and at the executive department level.

The economically attractive, cream-skimming projects have been built. The work ahead will be tougher.

Government guidance, financing, and administration will be increasingly necessary if the Nation is to achieve reasonably comprehensive, multiple-purpose development and conservation of its water resources.

We think good engineering plus good economics equals good politics.

Both legislative and executive department reorganization appear to be called for in order to establish a sound water-resources program to meet the needs of future generations.

Thank you very much, Senators.

The CHAIRMAN. Thank you, Mr. Pike, for the presentation of Mr. Norwood's statement. It was of very broad gait and very interesting.

(The complete statement of Gus Norwood, executive secretary, Northwest Public Power Association follows:)

STATEMENT OF GUS NORWOOD, EXECUTIVE SECRETARY, NORTHWEST PUBLIC POWER ASSOCIATION

Mr. Chairman and members of the select committee, my name is Gus Norwood. For the past 12 years I have served as executive secretary of the Northwest Public Power Association, comprising 105 consumer-owned electric distribution systems in Alaska, Montana, Idaho, Oregon, and Washington.

Public and cooperative electric systems provide electricity to about 2 million people in the Pacific Northwest. Our systems own and operate about $1 billion of electric plant and have a half billion dollar construction program in progress. We generate about a million kilowatts of electricity and expect to quadruple this amount.

Our systems pay into the U.S. Treasury about $25 million per year for power purchased from Federal hydroelectric systems, through the Bonneville Power Administration and the Bureau of Reclamation. This amount will more than double in the next decade.

BOTH A SPECIAL AND GENERAL INTEREST

Our association not only testified in favor of Senate Resolution 48, which created the select committee, we have urged over the years that such a resolution be introduced. We also testified in favor of its predecessor, Senate Resolution 148 of the previous Congress, which was also adopted by the U.S. Senate.

We have both a specialized and a general interest in the studies of the Select Committee on National Water Resources.

Our special interest is in an abundant supply of low-cost power to serve our people with electricity. On this special interest, we urge the select committee to recommend studies in regard to cost allocations, service life of dams, power pooling, interregional electric transmission lines, thermalhydro integration, the need for retention of the antimonopoly or preference clause, our recommendation for a better method of administering the power marketing functions of the Federal Government as by means of a regional power corporation proposed in S. 1927, the need for the adoption of a Federal capital budget, and the need for a Federal Department of Natural Resources.

We are interested also in the more general or nonpower aspects of water resources development.

Our systems are close to the people. They take a public interest point of view. Water resources development is a fundamental tool of economic expansion, of opening the great frontiers of western economic opportunities for both public and private enterprise. These five States possess over 60 percent of the untapped hydroelectric power potential of the Nation. We have a 15-million acre future irrigation potential. We have a great future through the provision of abundant, high quality industrial water. The Columbia River is a natural for future internal waterway development for navigation. The Columbia River, in particular, is susceptible to virtually complete control by means of upstream storage works. Major floods can be abolished. Additionally, we favor the fullest development of the recreational, wildlife, and fishery resources.

Because our association has taken a broad interest in comprehensive development of water resources, we took an active part in the long battle for the full development of the Hells Canyon reach of the Snake River. That battle is far from being over.

Another unique opportunity which has permitted our association to become deeply involved in the subject of water resources was the privilege extended to me in 1953 by Brig. Gen. L. H. Foote, North Pacific division engineer of the Corps of Engineers, to serve as a member of the 14-man general advisory committee on the 308 review of the Columbia River and its tributaries during the period 1953 to 1958.

We have submitted several hundred pages of testimony before committees of the Congress in regard to water resources, and we will refer to some of our previous testimony in order to avoid duplication.

WE SUBMIT TWO MAJOR POINTS

The central thesis of our testimony is outlined by the formula: Good engineering plus good economics equals good politics.

By good engineering we mean that the key to the physical control of rivers in general, and especially of the Columbia River, is upstream storage. In the Columbia River upstream storage can absolutely control all major floods.

Mr. Ben Torpen, perhaps the outstanding hydrologist to study the Columbia River, is authority for the statement that without upstream storage the power potential of the Columbia River will be cut in half. With upstream storage we can achieve virtually complete control of this huge river for flood control and power and the many other public purposes. Mr. Torpen's basic paper is attached as exhibit 2.

By good economics we mean that the extent to which we can squeeze the river, the extent to which we can achieve the fullest development on a truly comprehensive, multiple purpose basis, and the extent to which we can obtain these many benefits at the lowest annual cost depends primarily upon one factor—low cost money. The economic key to river development is a low rate of interest on the large capital investment needed. This requires public investment.

Thus sound engineering for upstream storage and sound economics through low cost public investments combine to achieve the goal of good politics which is the public interest.

Good politics in water resources development may also be expressed in terms of the half-century-old ideal of conservation so well defined by Gifford Pinchot and President Theodore Roosevelt: Conservation is the wise use of resources for the greatest good of the largest number of people for the longest time. This, of course, is an adaptation of the goal of happiness as set forth by Jeremy Bentham and other Utilitarians.

We submit that the select committee might well consider the wisdom of the framework provided by the formula: good engineering plus good economics equals good politics.

In amplification of this thesis I submit, as exhibit 1, a copy of my address of July 27, 1959, to the national convention of the American Institute of Planners at Seattle on the subject "How Fully Can We Develop the Columbia River?"

THE CASE FOR UPSTREAM STORAGE

The St. Lawrence is the best domesticated river in the world because of the upstream storage of the five great natural lakes which level the flood inflows and moderate the droughts so as to make the St. Lawrence the best regulated river in the world. Even TVA is far from having achieved such a high degree of control.

The case for upstream storage in the Columbia River Basin is amplified in the enclosed exhibits. Additionally, we call attention to our published testimony in the following hearings:

Upper Columbia River Development, 1956, Senate Committee on Interior and Insular Affairs, at pages 231–298, including exhibits A–J.

Upper Columbia River Development, 1958, Senate Committee on Interior and Insular Affairs, at pages 327–377, including exhibits K–T.

FLOODS NOT INEVITABLE

We are disturbed by the possibility that certain wrong impressions may be created by Committee Print No. 1 issued August 18, 1959, and prepared by Dr. Luna Leopold of the U.S. Geological Survey.

At pages 54–57 he presents charts and assertions which generally give the impression that floods are natural and inevitable and that the expenditures made for flood control have not taken care of the problem.

These statements have a connotation which differs from the denotation. Technically, in the sense of denotation, the isolated statements are generally correct. But the broad impression of the statements on the nontechnical reader is wrong. The connotation is such as possibly to lead the reader to oppose expenditures for flood control projects.

This inclination of personnel of the U.S. Geological Survey is not new. This same attitude of fatalism toward floods is shown in the book "Floods" by William G. Hoyt and Walter B. Langbein (Princeton University Press, 1955). These men

are also from the U.S. Geological Survey. When I reviewed the book "Floods" some years ago, I pointed out the incompleteness and the lack of breadth and imagination, especially when the authors failed to show how upstream storage reservoirs can actually turn the tables by putting floods to work.

Recently, in commenting on TVA's report calling for a national program of flood plain zoning, the Department of Interior letter of comments called attention to the fact that the U.S. Geological Survey has long advocated this approach to the flood problem. Our comments on the TVA report are enclosed as an exhibit.

Obviously there are many different flood situations and many different combinations of flood control solutions. However, Dr. Leopold might well have cited the dramatic contrast of the Colorado River floods of 1904–7 and the complete flood control provided by Hoover Dam.

Our Hungry Horse Dam high in the mountains of western Montana does the same thing. We need the equivalent of 16 Hungry Horse Dams in the Columbia River Basin to domesticate the river.

The Columbia River has had extremes of flow from 1,240,000 cubic feet per second at The Dalles down to 37,000 cubic feet per second, an erratic ratio of 35 to 1. By means of some 51 million acre-feet of upstream storage we can cut the maximum flood to about 600,000 cubic feet per second and bring up the minimum assured flow to about 125,000 cubic feet per second, thus the erratic ratio is reduced from 35 to 1 to about 4 to 1. We have achieved about 20 percent of our upstream storage goal and have about 80 percent of the job still ahead of us.

As the flow of the river is regulated by means of upstream storage, more of the water can be scheduled through the power turbines instead of over the spillways. Our ideal is the dry spillway—as at Hoover Dam.

### EVAPORATION EXAGGERATED

Dr. Leopold also makes the categorical statement at pages 30 to 33 of Committee Print No. 1 that "evaporation loss offsets gain from storage." He cites Lake Mead behind Hoover Dam as a horrible example.

In the first place Hoover Dam is doing an excellent job despite the well known evaporation losses. These losses do not offset the gains from storage. Secondly, the evaporation problem is not a recent discovery. It was understood and anticipated long before Hoover Dam was built. Thirdly, much progress is being made in studies and experiments on reducing evaporation by use of chemicals.

But our main reply is that the Columbia River Basin lies in the northern portion of the United States and partly in Canada where there is much less heat to cause evaporation. Also our reservoirs are filled from melting snow, with very cold water, during the summer months, and then the water is released in the winter. Evaporation in the Pacific Northwest is negligible.

These comments on floods and evaporation are submitted to illustrate the wide divergency in water problems and their solutions. We also hope the committee will insure that unsupported and unqualified statements such as those here mentioned will be corrected as the studies progress.

Another reason we have gone to this length to express our concern on the committee print statements on flood control and evaporation is that they fly in the face of the central and key engineering solution to the problems of the Columbia River by means of upstream storage.

We conclude this portion of our testimony by urging the select committee to have prepared a study of the upstream storage possibilities in the United States.

### FUNDAMENTAL REVIEW URGED

We respectfully submit the following 14 areas for consideration by the select committee as part of a fundamental review of the water resources situation of the Nation.

1. Legislative reorganization: Congress should give consideration to reorganization of its committee system: so as to do away with the present overlap among the Public Works, Interior and other committees. We would urge generally a committee on natural resources or at most two committees, one on water resources and one on land resources. The joint committee approach is another possibility.

2. Department of Natural Resources: The present division of responsibility among the Departments of Interior, Agriculture and Defense is not logical. The Congress should give consideration to the establishment of a Department of

Natural Resources with two basic divisions, a division of water resources and a division of land resources, as suggested in the minority report of the first Hoover Commission (Acheson, Pollock, Forrestal).

3. Reorganization of the Bureau of Reclamation into a nationwide agency as a broad division of water resources: It should be responsible for water conservation and development on a truly multiple purpose basis. Such reorganization need not preclude the use of military personnel on civil work, witness our experience with the CCC.

4. Adoption of a long range capital investment program in natural resources: We need about a 50-year program for systematically developing our natural resources. We are not urging the reestablishment of the National Resources Planning Board. We think planning should be an inherent legislative and executive function divided among the Congress, the Department of Natural Resources and the Executive Office of the President.

5. Adoption of a Federal capital budget: We favor legislation along the lines of S. 1244 for a capital budget which recognizes the distinction between long range capital investments in productive, self-liquidating projects and programs as against the current expenditures of Government.

In amplification of these recommendations we submit exhibit 3, an address to the Theodore Roosevelt Conservation Conference entitled "Conservation's Hundred Billion Dollar Challenge", by myself, at Denver, October 2, 1958. Also I call attention to my similar testimony of February 16, 1959, before the Senate Interior and Insular Affairs Committee during the hearings on Federal power marketing policies.

6. Endorsement of the Kerr-Trimble bills: We endorse these bills in principle particularly in regard to the adoption of a 100-year economic service life for water resources investments. The foundation for the 100-year approach has been laid in Senate Resolution 148 which requires that all agencies report the feasibility of future projects on both a 50- and 100-year basis when reporting to the U.S. Senate. The new Green Book of 1958 is also trending in this direction. Another horizon in the Kerr-Trimble bill is the inclusion of indirect or secondary benefits in evaluating projects. The Bureau of Reclamation has done some pioneering in this field. Undoubtedly more study is needed but we should get on with it.

7. Endorsement of S. 1927 to change the Bonneville Power Administration into the Bonneville Power Corporation: This is not a Columbia Valley Authority or a Tennessee Valley Authority. We think it is a much more realistic recognition of the need for a regional administrative machinery for better administration and financing of a regional, river basin challenge such as is presented by the Columbia River Basin. Two hearings have been held by the Senate Public Works Committee. Such legislation should be enacted.

8. Endorsement of the Kerr recreation bill to permit cost allocation for recreation purposes in connection with water resources projects.

9. Separation of the natural gas and the hydroelectric power functions of the Federal Power Commission: Since about 90 percent of the work of FPC is now in the gas field, that agency might now more appropriately be renamed the Federal Natural Gas Commission. The hydroelectric power functions might well be transferred to a new Commission, possibly in connection with the proposed Department of Natural Resources. Increasingly, FPC has fallen back in the hydro field. It failed to protect the public interest in such cases as the Hells Canyon and the fast tax writeoff decisions. The Commission publicly admits that there are over 500 hydroelectric projects which FPC believes should be licensed but which as yet are not under license. In its 38 years of activity FPC has issued licenses for only 7 percent of the Nation's hydroelectric power potential. Over 85 percent of the Nation's hydro is still unharnessed. Let's get on with the job of tapping our potential water power resources. To put it bluntly FPC has become a claimant agency of private monopoly electric corporations. No minor reform will take care of this problem.

10. Endorsement of legislation for the Alaska Water Resources Commission.

11. Endorsement of the Magnuson bill S. 584 to define comprehensive plan.

12. Endorsement of Senate Resolution 71 for a national power study.

13. Endorsement of community facilities legislation to make available Federal loan funds to local and State governments for construction of water resources projects.

14. A thorough study of upstream storage as a basic method of multiple purposes river control.

48186—60—pt. 3——13

CONCLUSION

The Nation at present is drifting aimlessly in the field of water resources. The piecemeal approach is taken both at the legislative and at the executive department level.

The economically attractive, cream-skimming projects have been built. The work ahead will be tougher.

Government guidance, financing and administration will be increasingly necessary if the Nation is to achieve reasonably comprehensive, multiple purpose development and conservation of its water resources.

We think good engineering plus good economics equals good politics.

Both legislative and executive department reorganization appear to be called for in order to establish a sound water resources program to meet the needs of future generations.

Thank you.

(The exhibits mentioned are on file with the committee.)

The CHAIRMAN. Mr. Clarence C. Strong, retired, U.S. Forest Service.

## STATEMENT OF CLARENCE C. STRONG, RETIRED, U.S. FOREST SERVICE

Mr. STRONG. Mr. Chairman, gentlemen of the congressional delegation, the statement whihc I wish to make relates to priorities in water-resources management that have arisen out of my 35 years of work in and trampling over the mountain areas of the Clark Fork and Missouri River drainages.

It is just briefly this, that there is one factor in managing water resources which is of far greater importance to the longtime public interest than whether we build big dams or small ones or where they are located or whether or not other water-harnessing facilities will be developed. That has been the feature upon which most of our attention has been directed in recent years. This factor which I mention is the improvement of the vegetative cover of these river drainages and the improving of the water-holding capacity potential of the soil, keeping the soil in place. We need every acre of land to be brought to its greatest potential for absorbing and holding water. We need a stabilized soil and hold it in place. Therefore, the matter of improving ground cover over the entire Clark Fork-Missouri Basin is of the highest priority.

We wish to commend the Montana delegation in Congress and other congressional delegations who are providing the leadership, sponsoring the legislation which I think brings this matter of improving the cover and the soil resources in the headwaters into what I think should be the very highest priority. In other words, what I am briefly saying is that to me the highest priority is improving the land in the upper headwaters. That to me comes ahead of the development of dams and the development of harnessing facilities.

I appreciate the chance to make this brief statement.

The CHAIRMAN. Thank you very much, Mr. Strong.

A number of others have requested the opportunity to be heard but in view of the number of them, I am going to suggest that they provide a copy of the statement that they would like to have in this record either to Senator Murray's office or to Congressman Metcalf. These include Walter Allen, Ray Loman, C. P. Fickes, William B. Sweetland, Robert C. Weller, and there may be others whose names I do not have.

I want to express the appreciation of the committee for the assistance of the local people, especially to the university for the use of this facility, to Senator Murray, Senator Mansfield, Congressman Anderson and Congressman Metcalf for their cooperation and for all whose contributions have helped make these hearings in Montana significant, and say to you that the information given us in these hearings and by these statements will be very valuable to the committee as it faces the responsibility of meeting its directive from the Senate.

Congressman Metcalf, do you have anything you want to say before we adjourn?

Representative METCALF. Again I renew my statement that the entire Montana congressional delegation are grateful to you for bringing your great committee here to hear about our problems which are a part of the national water problems and we look forward to the decision of the committee in the blueprint that you talked about for the development of these water resources which are so important for the industrial, recreational development of this great State of Montana.

The CHAIRMAN. The committee will adjourn.

(Whereupon, at 1:00 p.m., Monday, October 12, 1959, the hearing was adjourned.)

(Subsequently, the following statements were filed to be included in the record:)

STATEMENT BY RAY M. LOMAN, PRESIDENT, UPPER COLUMBIA DEVELOPMENT COUNCIL

Hon. Robert S. Kerr, chairman, and members of the committee, we are pleased to have your committee in our State and to have this opportunity to present the views of this organization, which is composed of water users throughout the Montana portion of the Columbia River drainage. We have a direct and important interest in the outcome of your inquiry and your deliberations. We respectfully submit our statement for your consideration.

The extent of water development is posed by your question as to what is needed. The time is long past when the unaltered natural flows of water are sufficient for our needs. On the other hand the wise provisions of Montana law and the development of our water resources to date in this State have set a pattern for development elsewhere. They have been responsive to our rapidly growing needs and form an excellent base for our future.

In the main, they have accomplished through private effort and enterprise an overall supply of water ample for our needs. Where State assistance has been needed, this has been provided without losing sight of the basic responsibility of the user to finance his direct benefit.

Specifically, municipalities and private water companies have maintained clean and ample supplies of water for their growing communities. These have been and should continue to be financed by the users of that water. Ranchers and farmers have built and maintained their irrigation-water supplies at their own expense and to their own benefit. They have done so under the protection of water laws which guarantee their right to this water so long as it is beneficially used. This is proper and important.

Where private farmer-rancher capital and facilities are not sufficient, Montana has provided through State funds a capitalization for community water projects in which the individuals using that water are obligated to repay the advanced funds. Each of these projects has paid off its responsibility or is doing so. The acreage developed is equal to that federally developed and the total cost is but a fraction of the Federal expenditure.

Industrial water has been provided through municipal and private sources, even for such thirsty industries as the pulp industry. There has been good provision for returning water from these plants in condition to be used downstream. Its future use has been neither impaired nor destroyed. Where im-

provements in the condition of returned water are needed, they are being made rapidly.

The Columbia drainage in western Montana has plenty of water potential for future needs, provided this water is not preempted by Federal or regional agencies and committed elsewhere. Montana has demonstrated its ability to make good use of its waters. It should be guaranteed a free hand to continue this productive use.

The Columbia drainage in the western half of our State is blessed with productive lands in its valleys, but this land is limited. Without it, much of the productive capacity of the drainage is destroyed. This we cannot afford. Hence, any proposal to inundate or block off these valleys is not only damaging but it is catastrophic. No matter how much hydropower, potential or stored water is made available for downstream use by gigantic valley-flooding projects, and this is a matter of opinion, one fact remains clear—western Montana would be economically strangled by valley blocking. Its transportation facilities would be cut off or hampered. We would lose much of the agricultural capacity of this area. We would be robbed of our good industrial sites which we need so badly for future development. We would lose the commercial contact of our communities which has been so important in our phenomenal growth since World War II. We would be deprived of the access to our timber resources which have been the mainstay of our industrial growth and vigor.

Obviously, such so-called development would be a death sentence. This leaves us with an alternative which is simply an outgrowth of our already successful policy of containing our water for useful purposes within our borders. We must look to our upper watersheds for development; development within our economic means and with the greatest potential for our people. We must build medium and small-sized dams in the upper reaches of our streams.

To do this means we must construct dams to impound an average of 25,000 acre-feet storage where they will not replace existing farms, ranches, communities, or industry. They must be located where they will benefit a maximum amount of the drainage, catch the water as quickly as possible after it falls and divert it to useful purposes, to domestic use, food and fiber production, industry, and for power production consistent with these purposes.

In this last connection we have an enviable record to date. Montana is a surplus power producing State, and its production facilities are heavy taxpaying supporters of our Government. This should constantly be encouraged in any water policy for this area. As our economy depends upon the perpetual life of our valleys and our water, so does our tax base depend upon the creative enterprise which keeps our economy alive.

Far too often this critical need has been overlooked in Federal policy. In too many instances, and Montana has several which tragically illustrate the point, we have sacrificed both economy and tax base to gain a temporary income from a large Federal project. Our passing advantage has turned rapidly into red ink, both publicly and privately.

Many times private efforts to build power facilities and serve an anticipated need have been frustrated by Federal substitute plans which lack practicality and serve only to retard the very development the Federal project backers claim to be forwarding.

Overall, we must not lose sight of the recreation advantages possible in our water use and development. Nor must we neglect the fish and wildlife resource which is so closely linked with watershed protection and conservation. No large development with its attendant widely fluctuating shorelines and its destruction of wildlife habitat can match the gains in these fields furnished by smaller reservoirs with stability, wide distribution, and sound biological values. These are both economic and cultural advantages.

Western Montana's intermountain valleys are in a vigorous transition. The timing for development has been dictated by these demands and met by this basic policy. Its flexibility and practicality will continue to serve the needs of this area. We need a friendly Federal policy which recognizes these needs and is devoted to preserving our proven system and to permitting it to be extended through the years of development. Our Montana water is being used currently for good purposes and is being protected. Any Federal policy which will encourage and advance this policy will be of the greatest benefit to western Montana. We do not want or need inundation or misapplied benevolence now or in the future. We do want and need freedom to work out solutions based on private endeavor, practically applied and based on the ability and willingness to pay for benefits derived.

Fundamental in the physical pattern of development is protection of the watershed itself, not alone the upper watershed but that in the valleys below. Upstream development provides the best approach to this problem, attacking the problem where it earliest occurs and dealing with it before it becomes acute. Where water retention is a problem, and this is universal, headwater control and development cannot be matched by downstream attempts to deal with a problem that already has become out of hand.

Physically, we must continue to develop by these means an ample domestic water supply and to assure water for agricultural production in these valleys where soil warrants such development and where the greatest acreage can be served. Power development must follow the pattern which has proved so successful—private enterprise reacting to the needs of the area and being given a more free hand to serve and provide new tax bases. All these will give flood control both in upper and lower reaches. Upstream flood control has not received appropriate attention in the large valley-blocking schemes.

To summarize our needs:

(1) The quantity of water development needed is that which will care for our domestic, food production, and industrial needs, to supply power and to provide recreational needs and watershed protection. We need a free hand to continue our pattern of use of Montana water in Montana as we have demonstrated our ability to do.

(2) The timing of water development is best determined by need, both as it occurs and as it can best be foreseen. We have amply demonstrated our ability to foresee that need as can be judged from our expanding economy and our surplus power production.

(3) The location of water development should be in the upper reaches of our western Montana valleys, where we can visualize a need for all water that can be made available, usefully and economically. Downstream needs should be judged on potential development of desalinization and on full use of thermal and atomic power to ease the inordinate demand on limited upstream resources.

(4) The physical pattern of development should be guided by the overriding needs to keep the western Montana valleys free and open for development, to continue to protect the watersheds, and to develop many headwater projects to assure maximum use of Montana water from the moment it falls to the ground.

It is understood that there is an overall problem of water resource management which affects more than one State and in such situations the role of the Federal Government should be one of advice and coordination of plans between the States involved by encouraging the several States to join together in mutual compacts which specify the responsibilities of each without undue advantage to either. Only in this manner can the established rights of the citizens of each State be adequately and surely protected.

We hope that the efforts of your select committee will result in the establishment of such a policy of water resource management on the part of the Federal Government.

---

The Upper Columbia Development Council, being in annual meeting assembled at Missoula, Mont., January 11, 1958;

Whereas the purpose and objective of the council is to promote "The economic and recreational development by maximum use of natural resources through conservation and creative free enterprise and the cooperation of local, State, and Federal governments," in the Clark Fork of the Columbia River Basin in western Montana,

Whereas the council is unalterably opposed to the construction of the Paradise Dam project, located on the Clark Fork of the Columbia River in Montana, and further seriously questions the economic value of similar huge multipurpose projects,

Whereas the council believes that here is a better and more practical solution of the problem of flood control, regulation of streamflow and power development, by the location and construction of numerous small dams on the headwaters of the tributaries of the Clark Fork, as illustrated by the map depicted in the council pamphlet, "Will This Be Western Montana's Future" (copy attached),[1]

[1] Placed in committee files for reference.

Whereas such a plan of water resource management has not been given an engineering survey and study such as has been given to huge multipurpose projects,

Whereas the council membership believes that the small dam proposal should receive such an engineering survey and thorough study, before any authorization for a Paradise Dam project is considered by the Congress of the United States: Therefore be it

*Resolved*, That the Members of the Congress of the United States are herewith requested and urged to consider and approve, with the necessary appropriation of funds, an engineering survey and study of the feasibility of small dams for flood control in Montana as well as downstream, streamflow regulation, and run-of-the-river powerplants in the Clark Fork of the Columbia River Basin, as an alternate plan as opposed to the construction of a Paradise Dam or similar projects; be it further

*Resolved*, That the executive secretary of the council is herewith instructed to forward a copy of this resolution to each and all Members of the Senate and House of Representatives of the Congress of the United States, to the Secretaries of Agriculture, Interior, and War, and to the Governor of Montana.

Adopted and approved unanimously, this 11th day of January 1958, by the members of the Upper Columbia Development Council in annual meeting assembled.

Attest:

RAY M. LOMAN, *President.*
C. P. FICKES, *Executive Secretary.*

---

PERSONAL STATEMENT BY CLYDE P. FICKES

Hon. Robert S. Kerr, chairman, and members of the committee, my name is Clyde P. Fickes, I live at 821 Stephens Avenue in Missoula, Mont., and I am executive secretary of the Upper Columbia Development Council, an organization of residents of western Montana who are concerned about the water resource. It seems desirable that you have some knowledge of my background in order that you may be able to evaluate what I have to offer on the matter you are concerned with. I was born in Nebraska in 1884 and came to Kalispell by way of Bedford County and Pittsburgh, Pa. in 1900. While unavoidably absent from the State for short periods of time during the ensuing years, Montana, especially western Montana, has been my home to which I have always returned, much as does the homing pigeon. In 1907 I joined up with the U.S. Forest Service and from then until 1919 I served as a district ranger on the Lewis & Clark, Flathead and Gallatin Forests, as an assistant supervisor on the Nezperce, Madison and Pend O'Reille Forests from 1919 to 1928 when I came into the regional office at Missoula where I worked as an administrative assistant in the offices of operation and engineering, being especially concerned with the planning, construction and maintenance of trails, telephone lines, and buildings of all kinds. During the period 1928 to 1944 my duties caused me to visit all the national forests in Montana and North Idaho many times on inspection trips that covered all areas extensively and some areas in detail. During this time it has been my good fortune to have gained an intimate knowledge of Montana's rivers and streams not had by many other persons. There are very few streams in our area that I have not traversed at some time or other.

The problem of protecting and conserving our water has been my concern and study ever since 1906 when I worked on the location survey of the St. Mary's-Milk River diversion canal on the Blackfoot Indian Reservation and had the opportunity to listen to discussions about water problems between the project engineer C. C. Babb and the location engineer, a man who had worked on the Panama Canal and the Salt River project in Arizona. At that time conservation was a very live topic of discussion and it was not long until I became an ardent disciple of Theodore Roosevelt and Gifford Pinchot and others. While I do not claim to be an authority on this or any other subject, I do believe, that as a result of a lifetime of observations and experience as a dedicated conservationist that I do know something about where Montana water comes from and how it get where it goes.

In 1944, I was transferred to the Treasury Department at Seattle and became engaged in the war surplus disposal activity, becoming associate regional director for War Assets Administration at Seattle and in 1946 regional director for WAA at Los Angeles, from which post I retired from Government service in 1947.

Returning to Montana that same year to resume residence in what I refer to as God's country, I have continued my interest in matters effecting my home country, not the least of which is conservation of our water resource. I have prepared a statement: Water Resource Management for the Clark Fork Basin in Montana, which has the approval and endorsement of the members of the Upper Columbia Development Council and which embodies the result of my observations and conclusions over the period I have described and I herewith present it to the select committee for their consideration. It is rather lengthy and I will not read it unless the chairman so desires.

One point I would like to give briefly some emphasis to, and that is that the action of the Senate in setting up such a representative body to consider the problem cannot be too highly praised, for this is a problem of such magnitude that the Congress should give serious consideration to the permanent establishment of an agency in which would be concentrated all fresh-water protection, development and administration. There are too many fingers in the pie now which does not make for a balanced and constructive program.

Please accept my hearty thanks for the opportunity to be heard.

---

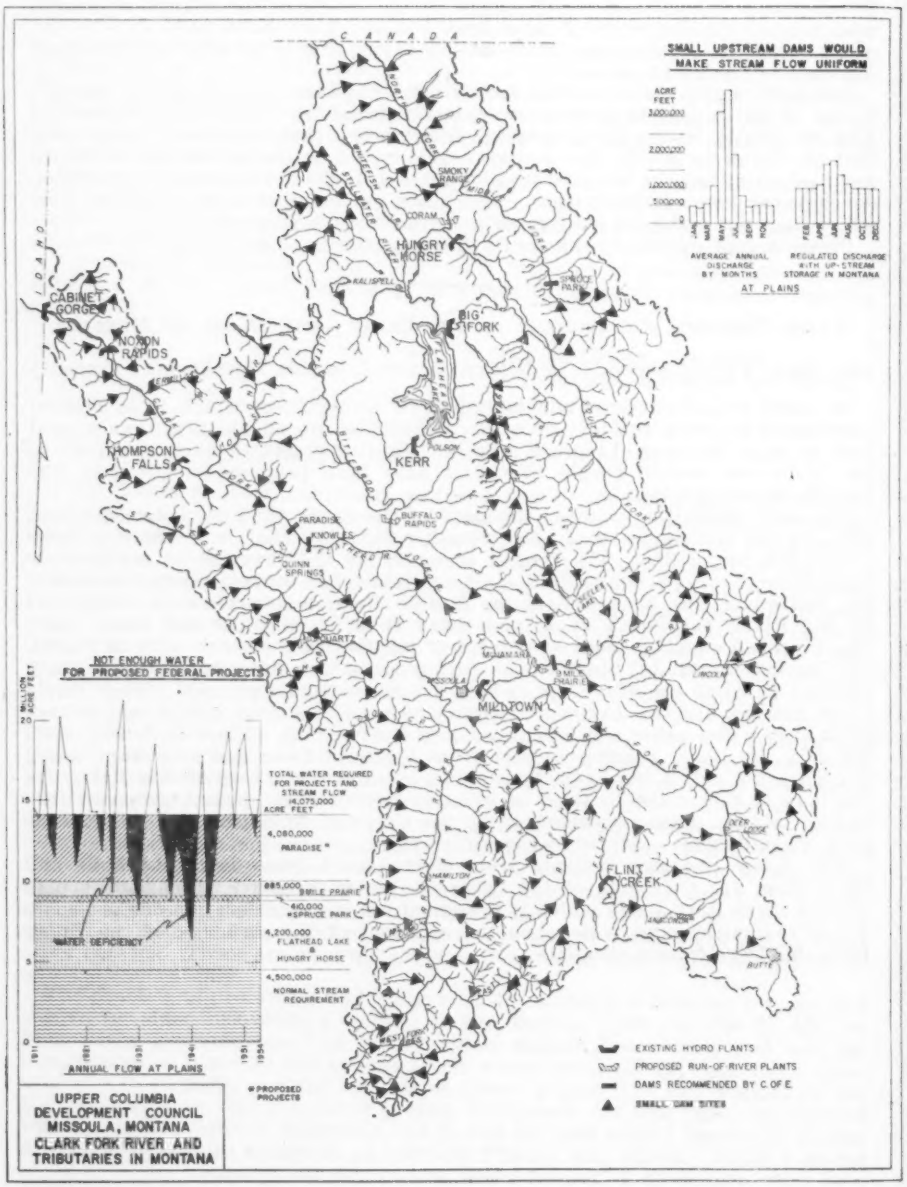
WATER RESOURCE MANAGEMENT IN THE CLARK FORK BASIN OF MONTANA

(By Clyde Fickes, executive secretary, Upper Columbia Development Council)

In order to secure some understanding of the problem which is of critical importance to every resident of western Montana, we should first take a good look at what the overall picture may be. In an attempt to do this, a map of the basin and several graphs or charts have been prepared to illustrate the various factors involved.

The map shows the complete drainage of the Clark Fork River in Montana, with all the tributaries that come together to make the river where it flows across the Idaho line. The largest tributary of the Clark Fork is the Flathead River flowing through Flathead Lake, which has for its principal branches, the Stillwater, the North Fork, the Middle Fork, better known to oldtimers as Big River, the South Fork, and Swan River flowing through Swan Lake. The Flathead supplies about 62 percent of the flow of the Clark Fork at Plains. The second largest tributary is the Bitterroot, which flows in from the south and the third is the Blackfoot, which comes in from the east. Other fairly large streams are the Jocko and Rock Creek. The source of the main Clark Fork rises a few miles south of the city of Butte, Mont. There are many small lakes in the Basin ranging in size from Flathead Lake down to many small pot holes, but only a few of the largest can be shown on a map of this scale. On the map is shown the location of existing hydroelectric plants, proposed run-of-river plants, dams recommended by the Corps of Engineers and the possible sites of small dams, as shown by the red triangles.

The many triangles indicate sites where small dams might be built and these sites are the parts of the proposed Water Resource Management plan for the Clark Fork Basin which is presented for the consideration of the Senate Select Committee and which has the approval of the members of the Upper Columbia Development Council.


CANADA
IDAHO
SMALL UPSTREAM DAMS WOULD MAKE STREAM FLOW UNIFORM
ACRE FEET
3,000,000
2,000,000
1,000,000
500,000
0
JAN MAR MAY JUL SEP NOV
FEB APR JUN AUG OCT DEC
AVERAGE ANNUAL DISCHARGE BY MONTHS
REGULATED DISCHARGE WITH UP-STREAM STORAGE IN MONTANA
AT PLAINS
CABINET GORGE
NOXON RAPIDS
THOMPSON FALLS
HUNGRY HORSE
KALISPELL
BIG FORK
KERR
POLSON
FLATHEAD LAKE
BUFFALO RAPIDS
PARADISE
KNOWLES
QUINN SPRINGS
MISSOULA
MILLTOWN
3 MILE PRAIRIE
HAMILTON
FLINT CREEK
ANACONDA
BUTTE
NOT ENOUGH WATER FOR PROPOSED FEDERAL PROJECTS
2 MILLION ACRE FEET
1911 1931 1935 1940 1951 1954
ANNUAL FLOW AT PLAINS
TOTAL WATER REQUIRED FOR PROJECTS AND STREAM FLOW 4,075,000 ACRE FEET
4,080,000 PARADISE *
885,000 3 MILE PRAIRIE *
610,000 *SPRUCE PARK
4,200,000 FLATHEAD LAKE & HUNGRY HORSE
4,500,000 NORMAL STREAM REQUIREMENT
WATER DEFICIENCY
* PROPOSED PROJECTS
EXISTING HYDRO PLANTS
PROPOSED RUN-OF-RIVER PLANTS
DAMS RECOMMENDED BY C. OF E.
SMALL DAM SITES
UPPER COLUMBIA DEVELOPMENT COUNCIL
MISSOULA, MONTANA
CLARK FORK RIVER AND TRIBUTARIES IN MONTANA

It has been said that this plan of water storage for stream regulation is "unrealistic," that "about all they (the small dams) would do is provide storage of value down stream, result in little or no power, give no community benefits, and the draw-down would be heaviest in summer, when it isn't desirable to Montanans." With the reading of this statement the reader can decide for himself whether or not the proposed plan is "unrealistic."

The annual flow graph in the lower left-hand corner of the map shows the runoff in acre feet of the Clark Fork River at Plains, Mont., for a period of over 40 years. Each vertical projection indicates the runoff for 1 year. The horizontal shaded areas across the graph represent the amount of water available for various storage projects. The bottom shaded area indicates the amount of water necessary to maintain normal stream flow throughout the year. This is water that cannot be included in any storage plan. The maximum discharge in any one year was 21,300,000 acre-feet in 1928 and the minimum discharge in any one year was 6,404,000 acre-feet in 1941. The average or mean discharge for the period was approximately 13,766,000 acre-feet.

The monthly flow graph in the upper right-hand corner indicates the average recorded discharge by months at Plains and the "regulated" discharge by months with the proposed upstream storage by small dams. It will be noted that about 65 percent of the runoff occurs in the months of May, June, and July, with 35 percent distributed over the other 9 months. Obviously, any storage plans that may be considered, must take into consideration the amount of water that it takes to keep the river "wet," 365 days of the year. It should be clear that the water indicated in the bottom shaded area of the annual flow graph cannot be made available for storage in a reservoir. Water that does not come down until January cannot be stored in June. The shaded areas on the annual flow graph indicate the water deficiency for storage purposes during the period represented.

It is believed that any plan to impound water in the streams rising in Montana should be made on the basis of the greatest use possible to the people of Montana as well as the folks down the river; such use is not confined to the generation of electric power, which in the long run is a minor factor in the water use picture. Much more important is the long-range planning for adequate water supplies for consumptive use by a rapidly growing population and the maintenance of a uniform stream flow throughout the year in our many side streams. Strange as it may seem to some, water runs downhill and after it leaves Montana, the use of it is lost to us here in Montana forever. If we want a proper and adequate water supply for our children and grandchildren, we had better plan now to store some of our water up where, as it comes down the hill, it will be available for use here in Montana.

And so, to get to the heart of the plan, it is proposed that before any more monolithic, monumental, Egyptian Pyramid type dams are built in Montana, that a detailed survey and study be made of the possibilities of building many small reservoirs in the headwaters of our streams as shown by the triangles on the map, so that the end result of such storage will be to the benefit of the people living in Montana, as well as those living in Oregon and Washington. It is believed that the development of such a plan of water conservation will, in the long run, be of infinitely greater value to all the people, than will the building of the proposed Paradise, Knowles, or similar dam.

Upstream means one thing to the person living in Portland, Oreg., and quite another to the person living in Kalispell or Missoula. It all depends on your viewpoint from where you look at it.

There persists in this country a school of thought that all hydroelectric production should be government owned and operated so as to assure, it is alleged, cheap power for a restricted class of privileged users. Our timber, a natural resource, has been under administration by the U.S. Forest Service for over 50 years and yet in all that time it has not been proposed that the government build and operate sawmills and sell the finished product, lumber. What sound reason is there to assume that our water resource should be managed any differently than our timber resource, by building powerplants, manufacturing and selling the finished product kilowatts? It appears logical and sound political practice for the Federal Government to create a new division (service) or Department of Water Conservation and place the administration of all fresh water resources, just as it has the forests, under a single control. It is interesting to note that a major forward step in that direction has been made in the establishment by the United States Senate of a Select Committee on National Water Resources com-

posed of members representing the four permanent committees of the Senate having something to do with the water resource.

There is another phase of water resource management which is being given a lot of emphasis, and that is flood control, which could better be termed "flood prevention." The present program of the Engineers of building dikes, deepening channels and constructing mammoth dams to control floods might be compared with the control and prevention of contagious diseases. Is a smallpox or polio epidemic controlled by building a large hospital or is their spread prevented by vaccination and inoculation? Floods can be prevented by headwater shortage vaccination.

Flood control for Portland, Oreg., to be sure. But what about flood control for Missoula, Mont.? The editor of the Moorefield, W. Va., Examiner, had this to say about flood control: "We attended the committee meeting on the flood prevention program * * * held at Brandywine. This is the project sponsored by the Potomac Valley Soil Conservation District * * * and should not be confused with the flood control project by the Corps of Engineers. The Army Engineers go in for huge dams which inundate large areas of land, whereas the flood prevention project is a series of small retention dams in the upper reaches of a watershed which prevents floods rather than controlling them."

Is it "unrealistic" to assume that 20 or 30 small dams on the Blackfoot would prevent flood damage at Missoula? Is it "unrealistic" to believe that a Paradise dam would not prevent flood damage at Missoura? It appears obvious that flood prevention is one of the important items in any water management plan. The engineers have spent a couple billion dollars building levees and deepening channels along the Mississippi River, trying to control floodwaters, but the old Missippi still goes where it wants whenever it wants. It seems safe to say that half that money spent in headwater storage would have, in the past 50 years, completely controlled the Mississippi floods. And the same is true of the Columbia River Valley, where by proper planning we can take the destructive crest off of any high water year by holding the floodwater up where it comes from.

The graph "Regulated discharge," has been prepared to show what good planning and control of upstream storage might do to secure uniform regulation of streamflow. It would be understood that while this graph is prepared for the flow of the Clark Fork at Plains, that it is representative of practically every side stream in the drainage regardless of the individual volume of discharge. It represents the monthly flow of Rock Creek just as much as it does the Clark Fork. The short monthly pipes on the graph could be increased in height and the long pipes shortened by regulating the river flow as illustrated by the regulated discharge graph. Everyone has observed how low the streamflow gets in the winter and early spring months. Do you suppose this could be an "unrealistic" approach to the regulation of streamflow and does it indicate that the drawndown would be heaviest in the summer months? It is "unrealistic" to suppose that this late flowing flood would not pass through downstream turbines, just because it was held behind little dams?

During the late summer months because of the demand for irrigation water the Bitterroot gets so low that the fish have a hard time to keep from getting sunburned while their bellies are scraping the bottom of the river. In order to try to protect the fish under these conditions, the Fish and Game Association has arranged to purchase from the State, 5,000 acre feet of water in the West Fork Reservoir. This water is to be released when and as the fish need the additional water. Is that a beneficial use of upstream storage? Would such a use of the water be possible if the water was stored behind a Paradise dam? This is believed to be a concrete example of how upstream storage can serve the needs of all the people, all the way to the ocean. How much better would western Montana fishing be if half the streambed mileage carried twice as much water from July to March as it does now? Fishermen ought to be able to figure that out with the greatest of ease. And it should not be difficult for the farmer to figure how much water would be available for irrigation if the June floodwater came down in August and September or even later. Is it "unrealistic" to suppose that this would not be "desirable to Montanans"? There is another aspect to these numerous small reservoirs that will be filled with water from early spring until winter and that is that they will furnish nesting places for all kinds of waterfowl in places where the birds will not be subjected to molestation by any but natural predators.

As to electric power production, that can be just as well and perhaps better and more satisfactorily accomplished by run-of-river plants, such as Cabinet Gorge. Noxon Rapids and the proposed Buffalo Rapids or Quartz Creek and

others. Such plants, operate at near capacity, the year round rather than only part of the year because of water shortage. Is it "unrealistic" to assume that power produced in 10 or 12 run-of-river plants, generating power continuously would not be just as useable as power from a plant that can operate only part of the year?

It has been stated that the construction of these many small dams will require the construction of roads into wilderness areas and thus open them up to unrestricted use as well as spoiling the natural scenery. What is the difference between a road built to haul out logs and a road built to haul in cement and other supplies? Today's logging roads are built to as high a standard as any construction road to a dam. And after a dam is completed, it will be a simple matter, if considered necessary, to destroy the usefulness of the construction road so that the litterbugs cannot use it.

Mention has been made of the number of employees necessary to operate these many small dams. Such dams as are contemplated will not require attention from resident employees as only periodic inspections will be necessary to see that the discharge gates are operating properly and that damage to the dam structure is not threatening. By the time they are built, it seems possible that electronic remote control devices can be installed so that a man, located in Missoula or Kalispell or elsewhere, can control the flow of water out of each reservoir by a pushbutton control, having on a board in front of him instruments to tell him what the water level in the reservoir is and the amount of water being discharged. But even without such controls the discharge gates can be set to discharge a constant flow of water from each reservoir in the system and required changes in the flow made by a visit of one man to the reservoir site.

Some question has been raised as to the cost of the small dams, which will be built on lands of low value as compared to one large dam. At $50 per acre-foot, a dam with a capacity of 50,000 acre-feet would cost $2½ million and a hundred such dams, holding 5 million acre-feet, $250 million. The dams would probably range in size from 5,000 to 100,000 acre-feet. Paradise is estimated to cost $553 million, of which over $300 million will be spent to buy the private land, move railroads, highways, and other improvements before the construction of the dam can be started. Is it "unrealistic" to assume that $200 million spent to build 80 small dams is a better investment than to spend $200 million just to rebuild 1 railroad so a Paradise dam can be built? Even if the small dams should cost more per acre-feet to build than a large dam, it is contended that the resulting benefits from the small dams to all the people along the river far exceeds that from one large dam which inundates much valuable and productive land and which primarily benefits the people below the dam.

The question has been raised, How are these small dams to be financed? The answer might be that the Federal Government and the State would share the cost on the same basis as the Federal highway funds are used. In order to provide that the storage dams return the cost of construction and maintenance to the Government it should be relatively simple to establish a toll charge of a fraction of a mill per kilowatt generated at the bus bar of each powerplant through which the water flows.

It is believed that the plan as outlined above is designed to serve the best interests of all the people of the Columbia River Basin as well as giving the folks in the Clark Fork Basin the use and protection of their interests in our most valuable natural resource water. It is designed to comply with the stated objectives of the Upper Columbia Development Council: "Economic and recreational development by maximum use of natural resources through conservation and creative free enterprise and the cooperation of local, State, and Federal Government.

---

STATEMENT OF WILLIAM B. SWEETLAND, KALISPELL CHAMBER OF COMMERCE

Mr. Chairman and members of the committee, I am William B. Sweetland, of Kalispell, Mont., representing the Kalispell Chamber of Commerce.

We appreciate deeply the opportunity to present our views with respect to water resource development in this area, and to recommend to you the projects which we think best suited for immediate consideration.

Western Montana is now one of the few areas of the Nation which has an abundance of water, and the growth and development of western Montana depends upon the protection of our future rights to the use of this most important natural resource.

The growth of western Montana has not kept pace with that of our neighbors downstream. Each year the demands for water increase in those States, so that in the foreseeable future these demands, and the prior rights established by prior use, might foreclose Montana's right to the use of its own waters and prevent the growth and development of our entire area, since that growth and development depends upon our right to the use of our waters. In our quest for protection, we ask for nothing that is not fair and equitable. Nor do we ask anything which would in any way jeopardize or impede the progress, growth, or development of our neighbors.

We have adopted a water resource policy which we believe must become the pattern for all future water resource development in the Pacific Northwest if all of its areas are to attain the growth and development to which they are entitled. Our adopted policy, which we believe is concurred in by all of western Montana, is as follows:

We submit this policy to you and ask that it be given your earnest consideration for adoption in any policies which may be formulated by your committee.

WATER RESOURCE POLICY

The Kalispell Chamber of Commerce favors the development of all feasible water resource projects, to the end that maximum benefits will be realized, not only in the State of Montana but also in the downstream area.

We believe that reasonable benefits to the State of Montana would include:

A. Reservation of the at-site power for sale in Montana.

B. Reservation of a reasonable share of the power generated at downstream installations by use of the water stored in Montana.

C. Sale of such power downstream until needed in Montana, at which time it could be recalled for sale in Montana.

D. Payments in lieu of taxes for property removed from local tax rolls for use in connection with any project.

E. Protection of beneficial use of Montana's waters in Montana.

F. Protection and enhancement of recreational areas.

G. Reasonable protection of fish and wildlife, with the requirement that the feasibility study of any project includes a study of and recommendation on protection of fish and wildlife features.

H. Prohibition against diversion of water or power outside the Columbia River Basin.

We believe that these benefits requested for the State of Montana are rendered reasonable by the fact that all powersites on the main stem of the Columbia River are now exhausted, and additional hydroelectric power on the main stem of the Columbia can be gained in the United States only by water stored in Montana. It thus appears only reasonable that Montana should receive a fair share of that power which can be produced only by the storage of waters in Montana and be given no less favorable treatment than it is now evident will be given Canada as a result of the negotiations of the International Joint Commission.

As you know the Army Engineers have proposed projects in western Montana which are primarily projects for the storage of water to firm up the generation of power at downstream installations. Most of the projects have met overwhelming resistance because of their adverse effects upon populated and settled areas. One such project, the Flathead Lake Outlet project, has met almost unanimous opposition from the time of its initial proposal and yet is being pressed by the engineers despite the unanimity of opposition.

We feel that the proposed projects are not feasible and are detrimental and dangerous to our entire area, while feasible projects which would provide more storage without disrupting established areas and creating havoc with the economic balance of large segments of western Montana are being ignored by the engineers for reasons which cannot be justified.

We read that agreement with Canada on Libby Dam is now believed eminent and we hartily endorse this project. We hope that it can soon be built so that storage can be provided without resort to the infeasible and hurtful projects now recommended by the engineers.

But regardless of Libby Dam, the Glacier View site on the North Fork of the Flathead River, with 3 million acre-feet of storage, could be commenced immediately. This project could be built without the destruction of any appreciable amount of private property, or the disruption of any significant number of people. And in addition to providing needed storage, it would create

another beautiful Montana lake in Glacier National Park, which could accommodate additional thousands of people in an area now visited by only an infinitesimal number of the visitors to Glacier Park.

We urge that you consider Glacier View project for immediate authorization and construction as was contemplated by the act creating Glacier National Park, in which reservation was made for the construction of a reclamation project.

We thank you for the opportunity of meeting with you and pledge to you our support for all projects which can be built without detriment to our State and its people, especially those projects we have here recommended.

---

STATEMENT BY MRS. JACK IMAN, OF HAMILTON, MONT.

Mr. Chairman, and members of the committee, I am Mrs. Jack Iman, a housewife and a member of the Rural Development Committee of Ravalli County. I have a citizen's interest in the resources of my country and how they can best be developed.

The particular concern of this hearing is for water resources, but my concern is for all resources, and I do not feel that they are separable, since anything that is done with soil, forests, wildlife, etc., affects water and vice versa. I do, however, have a particular concern, which is with the people who affect and are affected by whatever is done with any resource, and without which none of the resources mean anything. I am well pleased that this hearing gives all of us a chance to express our views on the development of a resource.

There are three points to any program which weeks to develop a resource. They are: The technicians who have specific skills to develop it (in our society these technicians are largely concentrated in Government agencies), the people who will benefit from the development, and the resource itself. Without any one of these, a resource development program is meaningless. If the public blunders ahead without a knowledge of what problems are involved (which knowledge must largely be provided by research and observation by the personnel of various public agencies) the work is fully as apt to be harmful as helpful. If the public agencies go ahead without the understanding and consent of the general public, the damage is much more serious. An apathy, a feeling of "there is nothing I can do about it" is created in the minds of people which ends with their disclaiming their responsibilities as citizens of a democracy. Freedom cannot be had without responsibility, and any action which lifts that responsibility from a man is fatal because it eats away his freedom and his sense of duty as surely as spring runoff carries away bare soil. It is my feeling that this process is dangerously advanced in our country right now.

This hearing is an attempt to give people a chance in shaping their own policies in water development. It is to be commended for challenging people to accept their responsibility. But some of the things that should have preceded the hearing were not done, and so too many people are unable to give considered recommendations based on understanding rather than on emotion. I think that too many agency personnel have failed to understand the whole picture. They have seen the resources as in a vacuum, instead of as problems the solution of which depends upon many people understanding and feeling a responsibility to help. The very fact that many agencies are up to 50 years ahead in research of what they are able to put into practice proves that they have failed in getting across to the public. The reason why they have failed is that they have thought it was enough to be a technician—to know the problem in their particular field—but they have for the most part neither taken a look at the whole picture of resource development nor at the people whom it will affect. Therefore, the public is confronted with many agency people, some saying, "It is like a rope," and some saying, "It is like a tree," when all the while we can see that it is an elephant, and still we are not sure what to do with it.

We are desperately in need of agency people who have studied history, literature, philosophy, sociology—in order to give them breadth of understanding of the people around them before they become so wound up in technology that they think the problems of resources are more important than the people involved. Apparently the education that agency people have had in the past has contributed to a feeling of superiority on the part of many of them. They have not been able to exercise the leadership which was their responsibility because they have often antagonized the people without whose support no program can be effective

by an attitude that might be summed up like this, "Do what I tell you because I know more and am therefore better than you." To many of us who have a genuine concern for our country and who try to see not only what effect the solutions offered will have on the resources, but also on the responsibility and freedom of the citizens who are supposed to benefit from it this attitude is maddening.

Until the agency people are able to say to us: "These are the results of the practices we now pursue; these are the results of studies we have made on resource problems; together let us build a program which will give our country the best use of its resources," and until we can respect one another as we work on them, resource development is most apt to continue only haltingly, and at the cost of reducing both the freedom and the sense of responsibility of our people.

Thank you for having this hearing and giving me the privilege of appearing.

---

STATEMENT BY ROBERT C. WELLER, EXECUTIVE SECRETARY, MONTANA DISTRICT COUNCIL, LUMBER AND SAWMILL WORKERS, UNIONS, UNITED BROTHERHOOD OF CARPENTERS AND JOINERS OF AMERICA, AFL–CIO

Honorable Chairman and members of the committee, our district council is composed of 18 local unions totaling 3,500 members and representing approximately 5,000 workers in the western Montana logging-lumbering industry.

We support, first, the benefits of "Montana water for Montana people" but we do not support those who use such a slogan to deceive the people while they quietly oppose the storing and harnessing of Montana water for the benefit of anyone; and, instead, allow it to flow to the seas to the benefit of no one.

We believe Montana's water resources should be stored in the largest reservoirs practical for multipurpose usage for the welfare of Montana and the Nation. We believe that as Montana waters are released from such storage their energy should be converted to hydroelectric power with first priority to the usage of such power allocated to the citizens of Montana and to industry within Montana; with any surplus over and above such needs and usages allocated to the downstream States.

We believe that Montana water, where possible and practical, should be used for irrigating Montana lands first, but, whether this is possible and practical or not, they should be stored and conserved and released also to the irrigation of downstream lands.

We believe that Montana waters should be stored for flood control purposes both within and without the borders of Montana.

To accomplish these aims and also to bring into Montana diversified industry and diversified agricultural possibilities, we favor federally constructed multipurpose dams. We are specifically on record in support of immediate construction of Paradise Dam and the earliest possible construction of Libby Dam, and our council has officially lent all possible financial and moral support to those two projects. We consider the Knowles Dam an acceptable but not desirable substitute for Paradise Dam.

Montana's greatest and most valuable resource is its children. Like Montana waters it is a resource largely wasted to the State of Montana and its communities. Montana parents historically have raised and educated their children only to lose them to other States that provide better industrial, and agricultural, and professional opportunities.

It is our belief and our hope that full and complete utilization of Montana waters through multipurpose dams such as Paradise and Libby, will provide to Montana the opportunities for security and advancement needed for the future generations of Montana citizens.

---

STATEMENT BY WALTER J. EVERIN, DIRECTOR, MONTANA FISH AND GAME COMMISSION

Western Montana in the upper Columbia River drainage is important to the recreational industry of our State. Glacier National Park is in this drainage as are several other of Montana's most important recreational areas. Some of the waters such as the North Fork, Middle Fork, and South Fork of the Flathead River, Swan River, Blackfoot River, Rock Creek, Thompson River and the Yaak River are nationally known trout streams. The Montana Fish

and Game Commission has reviewed the Army engineers' report "Water Resource Development, Columbia River Basin," June 1958, and is familiar with the developments proposed for this upper river system. Water development projects which create impoundments will make available more areas for certain types of recreation such as water skiing and boating. However, places to pursue this type of recreation in Montana are much more plentiful than the fast decreasing natural type of wildlife recreation area such as a trout stream provides, or the high quality hunting provided in wild or undeveloped areas. Montana is one of the last strongholds of some of the finest big game hunting and trout stream fishing on the continent. These resources cannot be replaced. Before water control structures are authorized by the Congress, the following should be implemented:

1. The decision to build individual projects should be based on adequate evaluation of the impact on all resources, not just the possible gains in irrigation, power, and flood control. In other words, the effects of a project on such irreplaceable resources as fish and game should be thoroughly studied prior to authorization by the Congress. The approach should be to project the needs for fish and wildlife recreation to the year 2000 and beyond so as to predict whether or not losses to some of the finest trout stream fishing and big game hunting in the Nation can be afforded. These studies should include investigation of means to mitigate fish and wildlife losses. Only sites resulting in a minimum of loss to fish and wildlife should be authorized.

2. When power dams are built, means should be provided to allocate a small portion of the power revenue (a fraction of a mill for each dollar revenue) to cover the greatly increased cost of sport fishing management caused by the impoundments. Such impoundments are most difficult to manage for sport fishing. The habitat is unfavorable for trout due to loss of spawning areas, etc., but favorable for nongame fish which soon overrun the water. Managing these waters for sport fishing creates a financial burden on the Montana Fish and Game Department beyond the moneys available from fishing licenses for this purpose.

3. In the upper Columbia River system the migratory cutthroat and Dolly Varden trout need the stream system for the spawning phase of their life cycle. Water control structures will block their spawning migrations and adequate means of fish passage will have to be constructed.

The Montana Fish and Game Commission is opposed to the construction of water control structures on the important trout streams because of the detrimental effects on both fish and game, and urges that adequate appraisal and studies be made of the Columbia River Basin as outlined.

---

STATEMENT BY WINTON W. WEYDEMEYER, MASTER, MONTANA STATE GRANGE

Water that falls as rain and snow on the mountainous lands of Montana is probably the single most important natural resource in the Columbia and Missouri River drainage basins. Most of the interest displayed over water in these basins has been related to development of facilities to control it and put it to use after it enters larger tributaries and main streams. Unfortunately, there has been much less concern about development of management techniques on upstream forest and rangelands designed to regulate water delivery in the amounts needed and at the time it is desired.

Montana occupies a unique and strategic position with respect to water, lying almost entirely in the headwaters of these two great rivers. Extensive forests are being managed for a multitude of wood products. Large areas of rangeland are being grazed by livestock and big game animals. Recreational use of these watersheds is increasing at fantastic rates. The effects of such uses upon the condition of the vegetation and soil and, hence, upon the amount, quality, and rate of water delivery in streams can have far-reaching consequences in the overall development of water use facilities for agricultural, industrial, power, and navigational purposes.

Despite the many improvements that have been and are being made in methods of managing the timber and forage resources of Montana, only a very few of these improvements have been developed specifically in the interests of better water management. Most have been directed at better timber and forage production. In consequence, we continually face problems about the influence of

various resource use activities on water and soil for which no answers are available. Information is badly needed concerning methods of managing our forest and rangelands, not only to produce timber and forage, but also to produce desirable streamflow and soil conditions.

One essential for getting this information and developing answers to these problems appears to be some kind of an inventory which will tell us how much water is being produced from various kinds of forest and ranges, when it is produced, and its condition. Another of even greater importance to solutions for these problems is much more research. Accurate knowledge is needed of the relationships between the water being produced on our forest and rangelands and the other uses being made of the vegetation and soil on these lands.

More specifically, we need immediate research on three main kinds of watershed management problems: (1) How to manage the millions of acres of forests in the upper Columbia River Basin to prevent floods and downstream damages from sediment. (2) How the extensive forests in the upper Missouri River Basin should be managed, not only for timber products, but also for any additional amounts of water they might yield to a section of the State where frequent water shortages occur. And, (3) How to restore protective watershed conditions, as well as better forage productivity, to several million acres of range where control of waterflow and soil erosion has been lost because the necessary knowledge about management of the vegetation and soil has been lacking.

---

### Statement of Montana Association of Soil Conservation Districts

#### Need for Increased Soil and Water Conservation Research Facilities in Montana

In the important dryfarming areas of the State, the conservation of moisture for production of crops is a serious problem. Recurring series of drought years tend to disrupt the economy of the State by crop failures, which cause severe distress to farmers and townspeople. Similarly, in the great ranching areas of Montana, the reduction of range feed and stock water, the low efficiency of water use for livestock production and for storage and diversion for downstream uses constitute a serious problem in the overall economy.

Studies have shown that we lose several feet of water annually from the surfaces of farm and ranch ponds and other surface water storage facilities. Despite our best efforts on fallow-crop farming systems on Montana drylands, research people tell us that over 80 percent of the water which falls during the fallow period is lost as far as plant use is concerned. Thus, the efficiency of conversion of water and of the energy from the sun into plant food on our drylands and croplands is much lower than it need be. Recent research indicates it may be possible to increase the efficiency of water use on agricultural lands by 50 percent or more. If so, the amount of water that could be more efficiently used for agricultural purposes may be many times more than the water that is stored in existing and proposed reservoirs within the State.

Soil, water, and human resources are our greatest basic resources in the State of Montana. The soil conservation districts of Montana believe that agricultural research devoted to improving the efficiency of water use and the conservation and wise management of our soil is of prime importance to the economy of the entire country. We believe that research to improve the efficiency of use of agricultural waters may be the most economical way in which we can extend the usefulness of our water resources.

Last year, the Secretary of Agriculture held a series of hearings over the Nation to determine the needs for increased facilities to do research on soil and water problems. Recently, the results of this study have been made available in a document summarizing these recommendations. This document, known as Senate Document No. 59 of the past Congress, sponsored by Senator Carl Hayden, is entitled "Facility Needs and Soil and Water Conservation Research." It will provide for the establishment of adequate facilities to do research on these important problems. In view of the importance of wisely conserving and utilizing our water resources, as well as our soil resources, we as representatives of the soil conservation districts of Montana wish to give our full support to soil and water conservation research as outlined in Senate Document No. 59. We submit this resolution as a part of our presentation at the public hearings on soil and water resources.

RESOLUTION

The Montana Association of Soil Conservation Districts and the State Soil Conservation Committee recognize the need to preserve water in our rain-deficient State. We urge that efforts be made by the Congress to provide upstream storage to hold water at its source for use on our lands and to maintain our ground water level. We would suggest that Public Law 566 be liberalized to make it more applicable to Montana in providing water storage and conservation practices.

OSCAR B. HIPPE,
*President, Montana Association of Soil Conservation Districts.*
JOHN M. SCHROEDER,
*State Soil Conservation Committee.*

---

STATEMENT OF RAVALLI COUNTY FARMERS UNION

The members of the Ravalli County Farmers Union take this means of stressing our feelings on water development for western Montana.

Therefore, we are asking action be taken now on a national policy.

Whereby, our river basins be fully developed by a multipurpose dam such as Paradise or Knowles.

To conserve these waters for full development to serve the people.

---

STATEMENT OF THE RAVALLI COUNTY FISH AND WILDLIFE ASSOCIATION

THE DEVELOPMENT AND USE OF THE WATER RESOURCES OF THE STATE OF MONTANA

The Ravalli County Fish and Wildlife Association wishes to make, for the record, the following statement of policy regarding the use of the water resources of Montana. We also take this opportunity to urge that a fundamental and consistent water policy which will take account of future as well as present water problems be spelled out by the Congress of the United States.

The primary need, in Montana as in the rest of the United States, is for an adequate and safeguarded amount of potable drinking water for people. The second need is for adequate amounts of pure water for farming and industry. Limitation of abundant supplies of high quality water for these two basic needs can strangle the development of Montana in the future, as it has so limited the development of other regions of western United States in the past and at present. A third need is for adequate flood control in the lower Columbia and Missouri drainages and a fourth need is for hydroelectric power. Intimately intertwined with these needs are the problems of maintaining the integrity of the primary watersheds from whence are derived the waters of the main rivers, is the timber, whose wise management is fundamental to our society.

Intimately connected with the wise management of these watershed areas of the Northwest is the problem of conserving our fish, wildlife, and other recreational resources, including areas which can be classed as wilderness areas.

In this age of explosively increasing population there is an increasing need for the resources of solitude, for the opportunity to stand for a moment in a place of quiet, to see again the natural world around us, to see the forests, the mountains, the birds, the deer, and fish in the streams as they were in the days of our childhood.

The need for this means of regenerating man's spirit will become steadily more important as our country becomes increasingly filled with people.

We, therefore, wish to be on record as favoring the orderly development of our water and wilderness resources in such a manner that the vital recreational resources are preserved for us and for posterity. Consistent with this, we favor the building of as few dams as adequately will take care of the previously mentioned needs. Thus we favor a few big dams, simply because we want to see as little tampering with the primary watersheds as possible. Statements that the proposed "wilderness bill" will interfere with the development of water resources ignore the fact the Federal Power Commission withdrawals take precedence over other uses of water in the proposed wilderness areas.

We are strongly in favor of increased pollution control of municipal and industrial wastes. This is one of the most inexpensive ways to increase the supply of pure water and at the same time to increase the recreational resources of those waters.

We specifically state that we take no doctrinaire position either for or against public or opposed to private power development.

We do support and recommend that our water resources be developed in an orderly and consistent manner which will yield the greatest degree of water conservation, flood control, and hydroelectric development with the least number of dams necessary to accomplish the ends. We must preserve adequate high quality recreational areas for our descendants.

STATEMENT BY JOHN B. HAZEN, VICE PRESIDENT AND GENERAL MANAGER, BUTTE WATER CO.

Most authorities agree that water use will double by 1975. Meeting this increased demand will present serious problems in many parts of Montana. The amount of water available will determine the ultimate limit on the growth and development of any area.

People cannot live in a city without water. Industry cannot locate or expand where water is inadequate for its needs. Much of our agriculture depends on irrigation. Water is an important part of our recreation and wildlife resources.

To meet this problem of providing more and more water intelligently, we must first know what water resources we have. The State engineers office is doing an excellent job of recording surface water rights and resources. This program is about 50 percent completed. The State bureau of mines and geology and the U.S. Geological Survey are conducting studies of ground water resources. The State board of health, with help from the Fish and Game Commission and the U.S. Public Health Service, are supplying information on the quality of these waters. These programs should be given all encouragement possible.

Increased storage will be necessary in many instances to maintain adequate streamflow.

Pollution control and reuse of water will contribute to the solution of our future water problems. Excellent progress has been made in pollution control and abatement since the State legislature passed the Pollution Control Act in 1955. Industry has been very cooperative and good progress is being made in the construction of municipal sewage treatment plants. Pollution from irrigation water returned to streams could become a serious problem in some areas due to silt and salts leached from the soil if irrigated acreage increases as much as visualized by some experts.

Water rights are based on the principle of prior appropriation under Montana law and this system is very satisfactory.

The State of Montana is doing a good job in administering control of its water resources and this control should remain with the State rather than the Federal Government. Federal assistance through matching funds and grants to State agencies, and the assistance from Federal agencies in research, resources studies, and planning have been very helpful.

---

STATEMENT OF ALBERT J. CRAMER, FLATHEAD LAKERS, INC.

My name is Albert J. Cramer. I am president of a 750-member western Montana taxpayers organization known as Flathead Lakers, Inc. I am appearing before your committee today in behalf of that organization. Flathead Lakers, Inc., were organized and incorporated under the laws of the State of Montana in 1958 as result of a distinct need for organized and well directed effort to protect Flathead Lake from further and serious encroachment attempts by down river special interests. Our membership represents a very large percentage of all lake frontage ownership on Flathead Lake and several hundred of us reside yearlong upon our properties.

Flathead Lake is one of the keystones of the economy of western Montana. Any change in Flathead Lake which damages its potential as a scenic wonder and natural recreation area would deliver a body blow to the economy of western Montana.

About 15 years ago the U.S. Army Engineers attempted to raise Flathead Lake to an extent that would have been disastrous to the tremendous recreational values which this great natural body of fresh pure water now represents.

They were stopped cold in that move by a determined and aroused group of western Montana citizens and with the help of our Montana congressional delegation.

Now the Army engineers propose to dredge the Flathead Lake outlet channel. This proposed project would make it possible to draw the lake down below the present authorized low water level of elevation 2883 and would also subject the lake to more violent and unseasonal water fluctuations all of which would result in damage to the resource which we are obligated to protect. I will not take the time of everyone concerned with this hearing today to explain or outline the damages we alleged but I assure you that Flathead Lakers, Inc., will be glad to present the facts to this committee or any other congressional committee at any time at their request.

We believe that the present proposal of the Army Engineers to dredge the outlet channel of Flathead Lake poses a threat to Flathead Lake as dangerous as the earlier proposal to raise the lake. With the natural barrier at the outlet we know that the lake can never be subjected to the violent, excessive, and unseasonal water level fluctuations which would occur if the lake were used as a storage reservoir to firm up down stream installations. We are unalterably opposed to the Flathead Lake Outlet dredging project as presently proposed by the U.S. Army Engineers and we wish to have the records of this committee so indicate.

We would not deny our downriver neighbors of benefits to be derived from stored Montana waters. However, we do demand that those waters be stored in mountain canyons where storage can be accomplished without damage, not in places like Flathead Lake where the entire economy of a portion of a State would be undermined and destroyed without reason or necessity. We lend our support to projects like Hungry Horse, Libby, Glacier View, and other projects of like location, which can be built without damage to important areas of our Nation.

We believe that we have an inherent right to have maintained, inviolate, our way of life and the natural resource that makes that way of life possible. We further believe that we would be derelict in our duty to ourselves and all those yet to come, if we did not fight to the bitter end any threat or possible threat to Flathead Lake. We are convinced that the present proposal of the Army engineers to dredge the Flathead Lake outlet channel is such a threat. I assure you that Flathead Lakers, Inc., intend to fight against the approval of this project with all the means at our disposal.

I wish to thank your committee for the privilege of appearing before you today. I assure you of the wholehearted support of Flathead Lakers, Inc., for water conservation and use development in Montana which will guarantee preservation of Flathead Lake in its present natural, beautiful, and useful state. I assure you further that this organization and its membership will be in there fighting with all the means at our disposal against any and all proposals which tend to convert Flathead Lake into an unsightly reservoir for power, irri gation, or flood-control benefits.

---

STATEMENT OF THE POLSON CHAMBER OF COMMERCE

POLSON, MONT., *October 12, 1959.*

Hon. ROBERT S. KERR,
*Chairman, Senate Select Committee on National Water Resources,*
*Washington, D. C.*

DEAR SIR: The Polson Chamber of Commerce of Polson, Mont., understands through the press and from a reported speech made by your staff director before the Association of Western State Engineers in Santa Fe, N. Mex., on August 20, 1959, that some of the questions to which your committee is seeking answers, are:

(*a*) What should be the national water development plan?

(*b*) What extent and character of water resources activities, Federal, State, local, and nongovernmental, will be required to provide the quantity and quality of water needed for use by population, agriculture, and industry, between the present time and 1980?

(*c*) What legislation is needed in future years to promote the kind of water resources development that we will need to bolster the economic growth of the Nation and what expenditure of funds, both public and private, is economically justified in water problems?

(*d*) What should be the physical pattern of water development in the future?

It is our opinion and in partial answer to these questions, we earnestly recommend that:

1. That our water resources be developed only as they are actually needed.
2. That the Federal Government get out of the power business by selling or leasing its public power projects to private or public interests.
3. That the Federal Government construct no more steam plants.
4. That the Congress and President of the United States be requested and urged to take all necessary action to:

(*a*) Preserve the water rights of the individuals and the States and to prevent Federal preemption and usurpation of those rights;

(*b*) To see that legislation is initiated and supported to reestablish to the individuals and the States, the rights taken from them by the Federal courts and the Justice Department;

(*c*) In every way possible reaffirm, renew, and defend the concepts that water rights are property rights and that these established rights, to the use of water, by a State or an individual, should not be taken away without due process of law and adequate compensation;

(*d*) Enact into law, H.R. 5555, 86th Congress, 1st session, or an act of substantial similarity.

5. That the Federal Government limit its activities with respect to water resources to the protection and development of port channels and interstate and international waterways that are navigable in fact, and such other water resource projects as afford direct and substantial benefits to Federal property.
6. That the Federal Government, together with non-Federal agencies and private citizens, should assume only joint responsibility for developments in the sphere of flood damage control and reclamation.
7. That the Corps of Engineers be not authorized to dredge the outlet of Flathead Lake, in Lake County.

Herewith is quoted an excerpt from a talk made by Dr. Paul J. Raver, then Administrator of the Bonneville Power Administration, on July 22, 1943, at Kalispell, Mont.:

"Brig. Gen. Warren T. Hannum (Gen. Warren T. Hannum, brigadier general of the U.S. Army) and I agreed today that all plans affecting the water level of Flathead Lake would be abandoned.

"This agreement included the abandonment of the so-called dredging and drawdown project at the lake's outlet.

"Following my telephone conversation with General Hannum our agreement was cleared by long-distance wire with all members of the Bonneville Advisory Board in Washington, D.C.

"The Bonneville Advisory Board will make this a matter of official action as soon as a meeting can be called.

"I am making this statement now with the full concurrence of General Hannum. I am making it for the purpose of settling in the minds of the people of western Montana any doubts they may have relative to the Government's plans.

"This decision is the result of 2 days of inspection of the Flathead Valley as the guest of your Governor. It is the result of the recent thorough investigations by the U.S. Army engineers and the presentations of evidence by the people of the Flathead communities."

We entertain the hope and faith that "words" of men are worthy of belief and as reliable as the Scriptures.

Respectfully submitted.

Legislative Committee, Polson Chamber of Commerce: By A. L. Helmer, Chairman, Lloyd I. Wallace, W. E. Pinkney, J. A. Turnage, F. N. Hamman, R. P. Heinz, Frank Maxam, H. M. Teel, H. W. Black, Ralph R. Tower, R. H. Lambeth, R. H. Wiedman, Members.

This action approved by the board of directors.

## STATEMENT OF MONTANA CONSERVATION COUNCIL

### LEADERSHIP-TRAINING PROBLEM

It should be recognized that all agencies, State and Federal, which deal with matters in the broad realm of conservation are, in the final analysis, responsible to the public. In one regard, their programs will succeed or fail, be worthwhile or not, in relation to the public's general understanding and support of those programs. In another regard, their programs will succed or fail, be worthwhile or not, in relation to what they contribute to the overall advancement of sound resource management, through the development of public conservation understanding.

But neither programs nor agencies which sponsor them, nor field personnel endeavoring to carry them out can operate adequately unless there is general public understanding and support, coupled with a genuine understanding on the part of the personnel of the agency, of the relationship of their work to the much broader conservation goals.

Administrators of conservation agencies are rightly concerned over the economic, material, and technical aspects of their agencies resource-management responsibilities, such as growing, harvesting, marketing, or engineering problems. Such resource-management responsibilities cannot be fulfilled adequately outside of the context of their social and cultural impacts. Thus, administrators likewise must be concerned over the social and cultural implications of their activities, as they are related to the broader values inherent in all natural resources.

It is apparent that the training of agency personnel in technical skills overshadows the training in and recognition of human and social values. It is logical that its overshadowing is attributable to academic training which is geared for and aimed at acquiring technical skills, with insufficient concern for training which results in a depth and breadth of understanding on the part of the individual.

Part of the reason for this problem lies at the doors of the training institutions. They supply the resource agencies with technically trained individuals. They in some measure set up curricula at the behest of accrediting committees of professional societies. They also endeavor to meet the requirements of the particular labor market for which their graduates are training. Then in doing these things, they overlook, or at least tend to deemphasize, the broad academic and social education of their students.

Another source of the problem is to be found in the agencies themselves. In many instances, in-service training involves only further technical training and overlooks the same broad qualities. The leadership of the agencies is usually, properly, and understandably derived from within each agency. These leaders, with all due respect for their administrative and technical competence, are themselves products of the technical institutions, and have been molded by the policies, philosophies, and traditions, of their respective agencies. Thus the circle is closed.

Industry has come to recognize this problem, and has sought ways of developing dynamic executive leadership. It has recognized fundamental responsibilities to facets of economic and social problems which, but a few years ago, were considered far outside of industries' realm. For instance, industries are spending large sums to give their young executive talent a breadth of training, study, and experience which most technical training institutions do not supply.

In a similar manner, conservation agencies, in order not to lose their positions of leadership, must recognize their responsibilities to such broadening training of their staffs, in order to develop leadership skills at all levels within their own organizations. Such leadership skills are needed to meet two problems:

1. To successfully administer and carry out agency programs.
2. To develop competent, well-informed, dynamic lay leadership and support on the community level.

It is in recognition of these problems that the Montana Conservation Council, in fulfilling the responsibilities imposed by the resolution pertaining to leadership training, is interested in fostering serious institutional and agency concern and discussion of these matters. Such action and analysis should point the way toward the development of dynamic training programs which will assure that agencies and institutions will redeem their leadership obligations to the public.

×